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Final Response to BDAT Related Comments Document
F025, K002-K008, K011, K013-15, K046, K061, K069
Volume 1-K

(U.S.) Environmental Protection Agency, Washington, DC

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This response to comments documdnt only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologyies and issues which related to 3rd 3rd Wastes Treatment STandards.

The commenters presented in this document are grouped according to major concerns of the commenters.

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FINAL
RESPONSE TO BDAT RELATED COMMENTS DOCUMENT

F025: Wastes from the Production of Chlorinated Aliphatics
K002-K008: Inorganic Pigments
K011, K013, K014: Acrylonitriles
K015: Still Bottoms from Benzal Chloride
K046: WW Treatment Sludges from Mft., Form., and Loading of Lead-Based Initiating Compounds
K061: Electric Arc Furnace Dust
and
K069: Emission Control Dust/Sludge from Secondary Lead Smelting

VOLUME I-K

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May 1990

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INTRODUCTION

This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters. This document is comprised of the following sections:

ISSUE CODE 1: General BDAT Aspects
ISSUE CODE 2: D001 - Characteristic Ignitable Wastes
ISSUE CODE 3: D002 - Characteristic Corrosive Wastes
ISSUE CODE 4: D003 - Characteristic Reactive Wastes and P and U Wastes Containing Reactive Listing Constituents
ISSUE CODE 5: D004/D010 - Characteristic Wastes for Arsenic and Selenium and K, P, and U Wastes Containing Arsenic and Selenium
ISSUE CODE 6: D005 - Characteristic Wastes for Barium and P013
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ISSUE CODE 8: D007 - Characteristic Wastes for Chromium
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ISSUE CODE 10: D009 - Characteristic Wastes for Mercury P and U Wastes Containing Mercury
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ISSUE CODE 25: **K015** - Still Bottoms from Benzal Chloride

ISSUE CODE 26: **K021** - Spent Antimony Catalyst.

(No Comments Were Received for this Waste Code)

ISSUE CODE 27: **K046** - WW Treatment Sludges from Manufacturing, Formulating, and Loading of Lead-Based Initiating Compounds

ISSUE CODE 28: **K060** - Ammonia Still Lime Sludge.

(No Comments Were Received for this Waste Code)

ISSUE CODE 29: **K061** - Electric Arc Furnace Dust

ISSUE CODE 30: **K069** - Emission Control Dust/Sludge from Secondary Lead Smelting

ISSUE CODE 31: **K071, K106** - Mercury Cell Process Wastes

ISSUE CODE 32: **K073** - Chlorinated Hydrocarbon Wastes.

(No Comments Were Received for this Waste Code)

ISSUE CODE 33: **K086** - Residues from Ink Formulation

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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

ISSUE CODE 37: **K028,K029, K095, K096** - Production of 1,1,1-Trichloroethane

ISSUE CODE 38: Wastewaters containing BDAT Constituents

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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

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Commenters are identified by both commenter number and commenter name. Comments within each section of this document have been assigned a sequential comment number.

Issues were obtained from the original comment submittal and were categorized based on the grouping specified above. The Agency's response to each comment follows immediately after the text of the document. For responses related to capacity issues, the reader should review the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume II Capacity Related Comments." For information regarding broad policy questions, the reader is directed to the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume III Policy Related Comments."

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No Comments Were Received for this Waste Code

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No Comments Were Received for this Waste Code

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ISSUE CODE 22: F025 - Wastes from Production of Chlorinated Aliphatics

A. Treatment Standard

Comment Number: 22-A-1
Docket Number: LD12-00128
Commenter: VULCAN CHEMICALS
Issue: F025
Subissue: TREATMENT STANDARDS
Comment:

F025

EPA is proposing two separate listings for F025; light ends and the combined spent filters, filter aids and desiccants from the manufacture of chlorinated aliphatic hydrocarbons. While we do not have any serious reservations regarding the levels of residual organics in the F025 nonwastewaters for either the light ends subcategory or the spent filter, filter aid and desiccants subcategory, we believe that the proposed residual levels for organics in F025 wastewaters are unrealistically too low.

For example, the maximum concentration for any single grab sample for 1,2-dichloroethane, carbon tetrachloride, and trichloroethylene is 0.007 mg/L. The EPA National Primary Drinking Water Regulation (or MCL) for these chemicals is 0.005 mg/L. The proposed treatment standard for 1,1-dichloroethylene, or vinylidene chloride, is also 0.007 mg/L. The EPA Office of Drinking Water did not consider this chemical to be a B2 carcinogen and established the MCL for this chemical at 0.007 mg/L on the basis of its noncancer toxicity. We see no justification to establish the residual TCLP concentration of these chemicals in F025 wastewaters at what are essentially drinking water standards. In most instances, the treated F025 wastewaters will be discharged in the plant process wastewater, as regulated by the facilities NPDES permit, although the wastewater may be temporarily stored in a surface impoundment which could be considered as land disposal.

Comment Number: 22-A-1 (con't)
Docket Number: LD12-00128
Commenter: VULCAN CHEMICALS
Issue: F025
Subissue: TREATMENT STANDARDS
Comment:

Accordingly, we urge EPA to reconsider the proposed treatment standards for F025 and to raise these standards to more realistic and cost effective levels.

COMMENT NUMBER: 22-A-1
DOCKET NUMBER: LD12-00128
COMMENTER: Vulcan Chemicals
ISSUE: F025
SUBISSUE: Treatment Standards
RESPONSE

The proposed wastewater standards for the chlorinated aliphatic U-wastes were based on the scrubber water residuals from incineration of K019 waste. However, for the final rule the Agency is promulgating wastewater treatment standards based on the analysis of wastewater treatment data from various sources, i.e., (1) Best Demonstrated Available Technology data base; (2) Industrial Technology Division data base; (3) National Pollutant Discharge Elimination System data base; (4) wet air oxidation; (5) Water Engineering Research Laboratory data base; and (6) Organic Chemicals, Plastics, and Synthetic Fibers data base. The Agency believes that wastewater treatment standards derived from these data are representative of diverse waste matrices and are therefore suitable for determining the F025 wastewater standards.

In any case, BDAT treatment standards are required to be based on the performance of the best demonstrated technology, and not on health based standards. Hence, the value of any promulgated BDAT concentration-based standard is not related to its toxicity.

EPA wishes to point out that any commenter who believes their waste cannot meet the treatment standard can petition the Agency for a treatment variance.

ISSUE CODE 23: K002-K008 - Inorganic Pigments

A.-. Support Standard
B.-. Background Document Corrections
C.-. Sampling Frequency

COMMENT NO.: 23-A-1
DOCKET NO.: LD12-00063
COMMENTER: Pfizer, Inc.
ISSUE: Pigments
SUBISSUE: K002 - K008 (Standards)
COMMENT:

Pfizer supports EPA's decision to prescribe stabilization as the Best Demonstrated Available Technology (BDAT) for wastewater treatment sludge from the production of chrome oxide green pigments (K006). As discussed in Pfizer's comments on the Second-Third Proposed Rule, recycling and high temperature metal recovery (HTMR), the two other technologies under consideration as BDAT, are not "demonstrated" technologies for hydrated K006.[1/] Pfizer is unaware of any technology that treats chromium (the hazardous constituent of concern in hydrated K006) as effectively as stabilization, and thus its selection as BDAT is appropriate.

In addition, Pfizer supports EPA's decision to promulgate separate BDAT standards for hydrated K006. As EPA notes in the preamble to the proposed rule, hydrated K006 is unique in that it contains significant quantities of boron. The presence of boron makes Pfizer's waste more difficult to stabilize than other pigment waste.[2/]

[1/] See letter from Mr. Wayne E. McCoy, Pfizer Materials Science Products, to Mr. Dwight Hlustick, EPA's Office of Solid Waste (June 8, 1989). This letter is incorporated by reference in these comments.

[2/] This phenomenon is similar to that experienced by cement manufacturers, who restrict boron in their raw material feed because it weakens the bond strength of the cement produc

COMMENT NO.: 23-A-1
DOCKET NO.: LD12-00063
COMMENTER: Pfizer, Inc.
ISSUE: Pigments
SUBISSUE: K002 - K008 (Standards)
RESPONSE:

The Agency appreciates the commenters support of the proposed BDAT treatment standard.

COMMENT NO.: 23-B-1
DOCKET NO.: LD12-00063
COMMENTER: Pfizer, Inc.
ISSUE: Pigments
SUBISSUE: Background Document Corrections
COMMENT:

In reviewing the Background Document for the proposed BDAT standards for inorganic pigment wastes, Pfizer discovered the following inconsistencies:

1. **The Background Document and the proposed rule are inconsistent in that the Background Document lists BDAT limits for both total chromium and hexavalent chromium, whereas the rule itself proposes limits only for total chromium. The inclusion of the hexavalent chromium limit in the Background Document seems to be a mistake in that it is inconsistent with the statement in the preamble (p. 48,436, col. 3) that hexavalent chromium limits have not been proposed for chromium-containing wastes (i.e., D007) because it is difficult to analyze treatment residues for this form of chromium.**

2. **Figure 2-5 of the Background Document is mislabeled; it should read "anhydrous," not "hydrated" chrome oxide green manufacture.**

3. **The Background Document's statement that K002-K008 represents a single treatability group (Background Document at 2-1 and 2-20) is somewhat misleading in that although these wastes are all amenable to stabilization, boron's presence in hydrated K006 makes it more difficult to stabilize.**

4. **The Background Document is inconsistent as to whether HTMR is a "demonstrated" technology for K006. On page 3-2, the Document states that K006 has a high metal content and therefore is amenable to HTMR, whereas on page 3-4, the Document states that hydrated K006 has a low chromium content, and therefore may not be recyclable.**

COMMENT NO.: 23-B-1
DOCKET NO.: LD12-00063
COMMENTER: Pfizer, Inc.
ISSUE: Pigments
SUBISSUE: Background Document Corrections
RESPONSE:

The Agency has corrected a few errors in the final version of the document that were pointed out by the commenter.

COMMENT NO.: 23-C-1
DOCKET NO.: LD12-00223
COMMENTER: Chemical Processors, Inc.
ISSUE: Inorganic Pigments
SUBISSUE: Sampling Frequency
COMMENT:

2. Section III.A.6.c. "Wastes from Inorganic Pigment Production" discusses the sampling frequency of inorganic pigment production wastewaters. The application of a 30-day sampling period derived for a wastewater stream is not an appropriate sampling frequency for a generated waste.

COMMENT NO.: 23-C-1
DOCKET NO.: LD12-00223
COMMENTER: Chemical Processors, Inc.
ISSUE: Inorganic Pigments
SUBISSUE: Sampling Frequency
RESPONSE:

The sampling frequency is derived from the Effluent Limitations Guideline Regulations for the chrome pigments subcategory of the inorganic chemicals industry. Wastewater forms of K002-K008 are frequently either landfill leachates or process related wastewaters. Both may be discharged to surface waters after treatment. Hence, the Agency feels that effluent guideline regulations are the most appropriate data sources for releases to surface waters. Because effluent guideline limitations and standards are based upon 30-day and 24-hour sampling values, the RCRA standard must reflect compliance with 30-day average and 24-hour sampling frequency standards. For individual facilities sampling frequencies are based on information within the wastewater discharge permits. The determination of sampling frequencies is made by the Agency at the time individual permits are granted.

ISSUE CODE 24: K011/K013/K014 - Acrylonitrile

A.-. Wastewater Definition
B.-. Acrylonitrile Standard
C.-. Performance Data
D.-. Numerical Standard vs. Wet Air Oxidation Method
E.-. Data Request

COMMENT NUMBER: 24 A-1
DOCKET NUMBER: LD12-00098
COMMENTER: BP America
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: wastewater definition
COMMENT:

3. The 3.5% TOC cutoff for wastewaters was incorrectly determined and should be raised to 5% based on the Agency's selection of BDAT.

EPA evaluated data it had on TOC levels of K011/K013 and K011/K013/K014 mixtures (10 data points) and calculated a 99 percentile TOC level to set the maximum TOC threshold for wastewaters. Over this TOC level the waste would be considered a non-wastewater. Although EPA describes its calculation of the TOC threshold in the "BDAT Background Document for K011, K013, and K014 (Addendum)", November 1989, the use of a 99 percentile TOC level is not justified and is counterproductive. If the TOC threshold is set too low (e.g. 3.5%), this will serve as a disincentive for waste minimization. Volume reduction will raise TOC levels to above 3.5%, pushing the wastewater into the non-wastewater category. There are strong economic incentives to reduce wastewater volumes when producers must apply BDAT. Smaller flows reduce the size of treatment equipment.

COMMENT NUMBER: 24 A (CONT) - 1

DOCKET NUMBER: LD12 -00098

COMMENTER: BP AMERICA

ISSUE: K11, 13, 14 · Acrylonitrile

SUBISSUE: wastewater definition

COMMENT:

The TOC threshold for acrylonitrile wastewaters should be based on TOC levels in the wastewater mixtures and the BDAT technology selected. EPA correctly recognizes that WAO can readily treat wastewaters containing up to 10% TOC. From our experience, 13-15% TOC is the upper limit. On the other hand, incineration of K011/K013/K014 wastewater, because of its low TSS and organic content and large volumes, would require extensive amounts of energy and incineration capacity.

Also, tremendous SO_2 tailgas emissions would result from burning ammonium sulfate in the wastewater. TOC levels above 5-10% are more suitable for incineration. The Agency identified incineration as BDAT for K011/K013/K014 non-wastewaters in the Second Third land ban rulemaking (54 FR 26594) and these wastes consisted of 17-31% TOC. Clearly, the non-wastewater TOC levels are an order of magnitude larger than wastewater TOCs, making category switching unlikely to impossible. Given the difference in TOC's of wastewaters and non-wastewaters and potential waste minimization disincentives, a TOC threshold higher than 3.5% is warranted.

COMMENT NUMBER: 24A (CONT) -1
DOCKET NUMBER: LD12-00098
COMMENTER: BP AMERICA
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: wastewater definition
COMMENT:

BP Chemicals strongly urges EPA to consider a higher TOC threshold for defining acrylonitrile wastewaters and to consider both the TOC levels in K011/K013/K014 waste mixtures and the BDAT technology identified (i.e. WAO for wastewaters; incineration for non-wastewaters). A 5% TOC level is suggested as appropriate and justifiable for the K011/K013/K014 waste treatability group.

ATTACHMENT A

K011/K013 Total Carbon Measurements
for a BPC Commercial Plant
November, 1989

Date	Total Carbon*
2	2.40%
4	2.34%
6	2.31%
9	2.23%
11	2.88%
13	2.60%
16	2.72%
18	2.02%
20	2.36%
23	2.23%
25	2.21%
27	2.40%
30	1.65%

COMMENT NUMBER: Z4A (CONT)-1
DOCKET NUMBER: LD12-00098
COMMENTER: BP AMERICA
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE:
COMMENT: Wastewater definition

99th percentile TOC = exp (y + Z99•S)
where y = average in (TOC) and TOC is in mg/L
Z99 = 99th percentile value of the standard normal variate
S = standard deviation, ln (TOC)

Therefore,

99th percentile TOC = exp (0.839 + 2.326 x 0.138)
= 3.2%

* total carbon approximately equals TOC ; grab samples were collected (K011/K013) after storage in large holding tank

COMMENT NUMBER: 24 A (CONT) -1
DOCKET NUMBER: LD12-00098
COMMENTER: BP America
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Wastewater definition
COMMENT:

To further support raising the TOC threshold above 3.5%, the data contained in Attachment A shows the total carbon content of a K011/K013 mixture measured three times weekly over a month of normal operation at one of BP Chemicals' commercial facilities producing acrylonitrile. These data were collected on grab samples of the wastewater prior to deepwell injection, but after storage in a large (greater than one day residence time) holding tank. Thus, the data represent "equalized" TOC levels, similar to compositing of as generated wastewater. Also, the total carbon measurement closely represents the TOC level since historical data have shown the total inorganic carbon level to be below 0.1%. As shown in the attachment the average TOC was 2.3% and the 99 percentile TOC calculates to be 3.2%, almost equal to EPA's calculated value in the BDAT Background Document (i.e. 3.3% TOC). The point here is that EPA's 3.5% TOC threshold value really represents more of a composite or equalized value than a grab sample value and does not reflect the true as-generated wastewater.

Comment Number: 24-A-1
Docket Number: LD12-00098
Commenter: BP America
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

The Agency determined the 5 percent TOC cutoff level for K011, K013, K014 wastewaters based on a 99.9 percent TOC level because in the Solvents and Dioxins Rule, EPA determined that a wastewater would be defined as containing less than 1 percent TOC (and less than 1 percent TSS) based on a calculated 99 percentile TOC of a collected number of wastes. The Agency, therefore, believes that the calculation of the 5 percent TOC cutoff level for wastewaters is in keeping with EPA's methodology and is justified.

The Agency identified incineration as BDAT for K011/K013/K014 nonwastewaters in the Second Third rulemaking (54 FR 26594, June 23, 1989), basing its identification on performance data for incineration of K011/K013/K014 sludge that had resulted from allowing as-generated K011/K013/K014 wastes to settle in a settling basin. The K011/K013/K014 sludge was the bottoms (underflow) stream from the settling basin. This waste consisted of 17 to 31 percent TOC and approximately 10 to 40 percent TSS.

Since making the determination of BDAT for K011/K013/K014 nonwastewaters in the proposed rule, the Agency has collected additional data regarding K011/K013/K014 waste characterization and treatment; these additional data are reported in the following table. The waste characterization for K011/K013/K014 shows that many as-generated K011/K013/K014 wastes consist of between 1 percent and 3 percent by weight total organic carbon and less than 1 percent by weight total suspended solids.

Comment Number: 24-A-1 (continued)
Docket Number: LD12-00098
Commenter: BP America
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

The Agency does not believe that incineration is BDAT for most as-generated K011/K013/K014 wastes because of the large volume and low Btu content of those wastes. It would require extensive amounts of energy and incineration capacity to incinerate those aqueous wastes. However, the K011/K013/K014 as-generated wastes are ideal candidates for wet air oxidation because of the relatively low organic content (compared to most incinerated wastes), low TSS, and aqueous nature. Additionally, EPA has treatment performance data for only wet air oxidation for the K011/K013/K014 wastes as-generated. EPA does not have performance data for wastes defined as wastewaters by the original BDAT definition (i.e., less than 1% TOC and less than 1% TSS).

The Agency is promulgating a definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS. The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

Source	Total organic carbon (TOC) (mg/l)	Waste Matrix
Tischler/Kocurek	20,488	K011/K013
Tischler/Kocurek	13,659	K011/K013
Tischler/Kocurek	15,024	K011/K013
Tischler/Kocurek	18,244	K011/K013
BP July 18, 1989	20,700	K011/K013/K014
BP July 18, 1989	20,600	K011/K013/K014
BP July 18, 1989	22,300	K011/K013/K014
BP July 18, 1989	14,800	K011/K013/K014
BP July 18, 1989	30,000	K011/K013
BP July 18, 1989	20,000	K011/K013/K014
BP November, 1989	24,000	K011/K013
BP November, 1989	23,400	K011/K013
BP November, 1989	23,100	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
BP November, 1989	26,000	K011/K013
BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
BP November, 1989	23,600	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$\text{99.9th percentile TOC} = \exp(\bar{y} + Z_{99.9}Sy) = \exp(10.01 + 3.0 \times 0.205) \approx 42,000$$

where:

y - $\ln X$
$\underline{X}$ - TOC (mg/l)
y - average log TOC
Sy - standard deviation log TOC
$Z_{99.9}$ - 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

COMMENT NUMBER: 24A-2
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: K011, 13, 14 - Acrylonitriles
SUBISSUE: Wastewater definition
COMMENT:

2. Use of Wet Air Oxidation for Wastewater BDAT Development is Supported

In the Second Third final rule (54 FR 26594, June 23, 1989), the Agency finalized BDAT standards for K011, K013 and K014 non-wastewaters. The standards, expressed as levels based on the use of incineration as BDAT, were effective immediately for surface land disposal, but were deferred to June 8, 1991 for deepwell disposal. Based on comments submitted by the APG and others, the Agency did not set treatment standards for K011, K013 or K014 wastewaters.

In this rulemaking, (54 FR 48447) EPA has proposed that K011/K013/K014 aqueous wastes below 3.5% TOC and 1% TSS be designated "wastewaters" for the purposes of BDAT development. Proposed wastewater BDAT levels, which are derived from limited wet air oxidation pilot plant data (provided by BP Corporation as confidential business information), are as follows:

Regulated Constituent	Max.Conc. mg/ℓ
Acetonitrile	38
Acrylamide	19
Acrylonitrile	0.06
Benzene	0.02
Cyanides (Total)	21

The BP Corporation technology has not yet been directly trialed on wastes other than K011/K013/K014 waste from BP operations, so that there is some risk that it may not be fully as efficient when applied to Monsanto or other acrylonitrile-process wastes. But, Monsanto generally supports its use by the Agency as the best information available at this time. Monsanto also supports the Agency's action to establish the 3.5% TOC breakpoint for defining wastewaters. The Background Document for K011, K013 and K014 BDAT development (Addendum, 11/89) clearly justifies this action. (As EPA acknowledges that wet air oxidation is applicable even to 10% TOC, the Agency should consider this higher level as the breakpoint so as not to preclude water conservation practices in the future.)

COMMENT NUMBER: 24 A (CONTINUED) -2
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: wastewater definition
COMMENT:

3. The 3.5% TOC Breakpoint for K011/K013/K014 Wastewaters is Supported, But EPA Should Adopt 10% to Accommodate Water Conservation.

The Agency has proposed to designate K011, K013 and K014 aqueous streams below 3.5% TOC and 1% TSS as wastewaters. Monsanto understands that this definition applies not only to these streams as generated, but also the combined K011, K013 and K014 waste streams as normally aggregated for treatment. As such, the proposed definition is supported because it addresses earlier concerns wherein normally generated aqueous wastes may have been defined as non-wastewaters, making them subject to the previously promulgated BDAT for K011, K013 and K014 non-wastewaters which was based on incineration. Monsanto continues to believe that incineration is not a reasonable or available technology for these aqueous wastes.

As discussed above, EPA should consider setting the "wastewater" breakpoint at 10% rather than 3.5% so as not to preclude future water conservation.

Comment Number: 24-A-2
Docket Number: LD12-00116
Commenter: Monsanto
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

Since making the determination of BDAT for K011/K013/K014 wastewaters in the proposed rule, the Agency has collected additional data regarding K011/K013/K014 waste characterization and treatment; these additional data are reported in the following table. The waste characterization for K011/K013/K014 shows that many as-generated K011/K013/K014 wastewaters consist of between 1 percent and 3 percent by weight total organic carbon and less than 1 percent by weight total suspended solids.

The Agency does not believe that incineration is BDAT for most as-generated K011/K013/K014 wastewaters because of the large volume and low Btu content of those wastes. It would require extensive amounts of energy and incineration capacity to incinerate those aqueous wastes. However, the K011/K013/K014 as-generated wastes are ideal candidates for wet air oxidation because of the relatively low organic content (compared to most incinerated wastes), low TSS, and aqueous nature. Additionally, EPA has treatment performance data for only wet air oxidation for the K011/K013/K014 wastes as-generated. EPA does not have performance data for wastes defined as wastewaters by the original BDAT definition (i.e., less than 1% TOC and less than 1% TSS).

The Agency agrees with the commenter that the wet air oxidation technology has been only used on BP wastes. The Agency believes, however, that the waste generated from the BP process is more difficult to treat because it contains K014, a waste with a higher percentage of organics than K011 and K013, thereby making it more difficult to treat.

Comment Number: 24-A-2 (continued)
Docket Number: LD12-00116
Commenter: Monsanto
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

The Agency would also point out that a mechanism is in place, (i.e., treatability variance) if the waste generated by Monsanto is different than the BP wastes.

The Agency is extending the definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS so that the wet air oxidation data can be used to develop standards (rather than designate incineration as the BDAT). The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience. Therefore, the Agency will not promulgate a wastewater cutoff level of 10 percent TOC.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

Source	Total organic carbon (TOC) (mg/l)	Waste Matrix
Tischler/Kocurek	20,488	K011/K013
Tischler/Kocurek	13,659	K011/K013
Tischler/Kocurek	15,024	K011/K013
Tischler/Kocurek	18,244	K011/K013
BP July 18, 1989	20,700	K011/K013/K014
BP July 18, 1989	20,600	K011/K013/K014
BP July 18, 1989	22,300	K011/K013/K014
BP July 18, 1989	14,800	K011/K013/K014
BP July 18, 1989	30,000	K011/K013
BP July 18, 1989	20,000	K011/K013/K014
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BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
BP November, 1989	26,000	K011/K013
BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
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BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$99.9\text{th percentile TOC} = \exp\left(\bar{y} + Z_{99.9} Sy\right) = \exp(10.01 + 3.0 \times 0.205) \approx 42{,}000$$

where:

$y = \ln X$

$\underline{X}$ = TOC (mg/l)

y = average log TOC

Sy = standard deviation log TOC

$Z_{99.9}$ = 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

COMMENT NUMBER: 24 A-3
DOCKET NUMBER: LD12-00189
COMMENTER: Du PONT
ISSUE: K011, 3, 14 - Acrylonitrile
SUBISSUE: Wastewater definition
COMMENT:

VI. CYANIDE WASTES - ACRYLONITRILE WASTEWATERS (K011; K013; K014)

As noted previously, Du Pont participated in the development of comments submitted by the "Ad Hoc Acrylonitrile Producers UIC Group" and incorporates those comments herein. Du Pont would like to emphasize its strong support for the Agency's proposal to increase the %TOC level above 1% whereby such wastes would be considered "wastewaters" for land disposal restriction purposes. Du Pont's K011/K013/K014 combined streams generally exceed 1% TOC yet are currently disposed by underground injection. This disposal technique is appropriate for these wastes and we believe is an environmentally protective disposal method at our Beaumont, TX plant where these waste streams are generated. Unless the Agency increases the %TOC level for such acrylonitrile wastes, these wastes may be prohibited from being disposed by underground injection. We believe that such an elevation of %TOC for the purposes of considering these streams "wastewaters" for land ban purposes is appropriate and reflective of the actual waste management practices prevalent in the industry today. The level selected should certainly be no lower than 3.5% and we would request that the Agency seriously consider the request of the Ad Hoc group that, based on the BDAT technology selected for these wastes of wet air oxidation, that a higher %TOC level is certainly justified.

Comment Number: 24-A-3
Docket Number: LD12-00189
Commenter: DuPont
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

The Agency is extending the definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS so that the wet air oxidation data can be used to develop standards (rather than designate incineration as the BDAT). The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

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BP July 18, 1989	20,000	K011/K013/K014
BP November, 1989	24,000	K011/K013
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BP November, 1989	23,100	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
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BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
BP November, 1989	23,600	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$99.9\text{th percentile TOC} = \exp(\bar{y} + Z_{99.9}Sy) = \exp(10.01 + 3.0 \times 0.205) \approx 42{,}000$$

where:
y = lnX
$\underline{X}$ = TOC (mg/l)
y = average log TOC
Sy = standard deviation log TOC
$Z_{99.9}$ = 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

COMMENT NUMBER: 24A-4
DOCKET NUMBER: LD12-00216
COMMENTER: BP CHEMICALS
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Wastewater definition
COMMENT:

3. **The 3.5% TOC cutoff for wastewaters was incorrectly determined and should be raised to 5% based on the Agency's selection of BDAT.**

EPA evaluated data it had on TOC levels of K011/K013 and K011/K013/K014 mixtures (10 data points) and calculated a 99 percentile TOC level to set the maximum TOC threshold for wastewaters. Over this TOC level the waste would be considered a non-wastewater. Although EPA describes its calculation of the TOC threshold in the "BDAT Background Document for K011, K013, and K014 (Addendum)", November 1989, the use of a 99 percentile TOC level is not justified and is counterproductive. If the TOC threshold is set too low (e.g. 3.5%), this will serve as a disincentive for waste minimization. Volume reduction will raise TOC levels to above 3.5%, pushing the wastewater into the non-wastewater category. There are strong economic incentives to reduce wastewater volumes when producers must apply BDAT. Smaller flows reduce the size of treatment equipment.

The TOC threshold for acrylonitrile wastewaters should be based on TOC levels in the wastewater mixtures and the BDAT technology selected. EPA correctly

COMMENT NUMBER: 24A (CONT)-4
DOCKET NUMBER: LD12-00216
COMMENTER: BP Chemicals
ISSUE: K011,13,14 - Acrylonitrile
SUBISSUE: Wastewater definition
COMMENT:

recognizes that WAO can readily treat wastewaters containing up to 10% TOC. From our experience, 13-15% TOC is the upper limit. On the other hand, incineration of K011/K013/K014 wastewater, because of its low TSS and organic content and large volumes, would require extensive amounts of energy and incineration capacity. Also, tremendous SO_2 tailgas emissions would result from burning ammonium sulfate in the wastewater. TOC levels above 5-10% are more suitable for incineration. The Agency identified incineration as BDAT for K011/K013/K014 non-wastewaters in the Second Third land ban rulemaking (54 FR 26594) and these wastes consisted of 17-31% TOC. Clearly, the non-wastewater TOC levels are an order of magnitude larger than wastewater TOCs, making category switching unlikely to impossible. Given the difference in TOC's of wastewaters and non-wastewaters and potential waste minimization disincentives, a TOC threshold higher than 3.5% is warranted.

To further support raising the TOC threshold above 3.5%, the data contained in Attachment A shows the total carbon content of a K011/K013 mixture measured three times weekly over a month of normal operation at one of BP Chemicals' commercial facilities producing

COMMENT NUMBER: 24A (CONT)-4
DOCKET NUMBER: LD12-00216
COMMENTER: BP CHEMICALS
ISSUE: K011, 13, 14 - Acrylonitriles
SUBISSUE: Wastewater definition
COMMENT:

acrylonitrile. These data were collected on grab samples of the wastewater prior to deepwell injection, but after storage in a large (greater than one day residence time) holding tank. Thus, the data represent "equalized" TOC levels, similar to compositing of as generated wastewater. Also, the total carbon measurement closely represents the TOC level since historical data have shown the total inorganic carbon level to be below 0.1%. As shown in the attachment the average TOC was 2.3% and the 99 percentile TOC calculates to be 3.2%, almost equal to EPA's calculated value in the BDAT Background Document (i.e. 3.3% TOC). The point here is that EPA's 3.5% TOC threshold value really represents more of a composite or equalized value than a grab sample value and does not reflect the true as-generated wastewater.

BP Chemicals strongly urges EPA to consider a higher TOC threshold for defining acrylonitrile wastewaters and to consider both the TOC levels in K011/K013/K014 waste mixtures and the BDAT technology identified (i.e. WAO for wastewaters; incineration for non-wastewaters). A 5% TOC level is suggested as appropriate and justifiable for the K011/K013/K014 waste treatability group.

COMMENT NUMBER: 24A (CONT)-4
DOCKET NUMBER: LD12-00216
COMMENTER: BP CHEMICALS
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Wastewater definition
COMMENT:

ATTACHMENT A

K011/K013 Total Carbon Measurements
for a BPC Commercial Plant
November, 1989

Date	Total Carbon*
2	2.40%
4	2.34%
6	2.31%
9	2.23%
11	2.88%
13	2.60%
16	2.72%
18	2.02%
20	2.36%
23	2.23%
25	2.21%
27	2.40%
30	1.65%

99th percentile TOC = exp (y + Z99·S)
where y = average ln (TOC) and TOC is in mg/L
Z99 = 99th percentile value of the standard normal variate
S = standard deviation, ln (TOC)

Therefore,

99th percentile TOC = exp (0.839 + 2.326 x 0.138)
= 3.2%

* total carbon approximately equals TOC ; grab samples were collected (K011/K013) after storage in large holding tank

Comment Number: 24-A-4
Docket Number: LD12-00216
Commenter: BP Chemicals
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

The Agency determined the 5 percent TOC cutoff level for K011, K013, K014 wastewaters based on a 99.9 percent TOC level because in the Solvents and Dioxins Rule, EPA determined that a wastewater would be defined as containing less than 1 percent TOC (and less than 1 percent TSS) based on a calculated 99 percentile TOC of a collected number of wastes. The Agency, therefore, believes that the calculation of the 5 percent TOC cutoff level for wastewaters is in keeping with EPA's methodology and is justified.

The Agency identified incineration as BDAT for K011/K013/K014 nonwastewaters in the Second Third rulemaking (54 FR 26594, June 23, 1989), basing its identification on performance data for incineration of K011/K013/K014 sludge that had resulted from allowing as-generated K011/K013/K014 wastes to settle in a settling basin. The K011/K013/K014 sludge was the bottoms (underflow) stream from the settling basin. This waste consisted of 17 to 31 percent TOC and approximately 10 to 40 percent TSS.

Since making the determination of BDAT for K011/K013/K014 nonwastewaters in the proposed rule, the Agency has collected additional data regarding K011/K013/K014 waste characterization and treatment; these additional data are reported in the following table. The waste characterization for K011/K013/K014 shows that many as-generated K011/K013/K014 wastes consist of between 1 percent and 3 percent by weight total organic carbon and less than 1 percent by weight total suspended solids.

The Agency does not believe that incineration is BDAT for most as-generated K011/K013/K014 wastes because of the large volume and low Btu content of those wastes. It would require extensive amounts of energy and incineration capacity to incinerate those aqueous wastes. However, the K011/K013/K014 as-generated wastes are ideal candidates for wet air oxidation because of the relatively low organic content (compared to most incinerated wastes), low TSS, and aqueous nature. Additionally, EPA has treatment performance data for only wet air oxidation for the K011/K013/K014 wastes as-generated. EPA does not have performance data for wastes defined as wastewaters by the original BDAT definition (i.e., less than 1% TOC and less than 1% TSS).

The Agency is extending the definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS so that the wet air oxidation data can be used to develop standards (rather than designate incineration as the BDAT). The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

Source	Total organic carbon (TOC) (mg/l)	Waste Matrix
Tischler/Kocurek	20,488	K011/K013
Tischler/Kocurek	13,659	K011/K013
Tischler/Kocurek	15,024	K011/K013
Tischler/Kocurek	18,244	K011/K013
BP July 18, 1989	20,700	K011/K013/K014
BP July 18, 1989	20,600	K011/K013/K014
BP July 18, 1989	22,300	K011/K013/K014
BP July 18, 1989	14,800	K011/K013/K014
BP July 18, 1989	30,000	K011/K013
BP July 18, 1989	20,000	K011/K013/K014
BP November, 1989	24,000	K011/K013
BP November, 1989	23,400	K011/K013
BP November, 1989	23,100	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
BP November, 1989	26,000	K011/K013
BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
BP November, 1989	23,600	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$\text{99.9th percentile TOC} = \exp(\bar{y} + Z_{99.9}Sy) = \exp(10.01 + 3.0 \times 0.205) \approx 42{,}000$$

where:

$y = \ln X$

$\underline{X} = \text{TOC (mg/l)}$

y = average log TOC

Sy = standard deviation log TOC

$Z_{99.9}$ = 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

COMMENT NUMBER: 24A-5
DOCKET NUMBER: LD12-00219
COMMENTER: BRYAN, CAVE, McPheeters & McRoberts
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: wastewater definition
COMMENT:

II. THE PROPOSED THRESHOLD FOR DISTINGUISHING WASTEWATERS FROM NONWASTEWATERS IS UNNECESSARILY LOW.

The Group supports the Agency's decision to establish a specialized "wastewater" definition for the K011/K013/K014 stream with a TOC threshold higher than the generic 1 percent concentration used for other wastes. However, the proposed threshold of 3.5 percent TOC is unnecessarily low and may impede efforts by producers to reduce the volume of their waste streams.

The Agency arrived at the 3.5 percent upper limit based upon a calculation of the 99th percentile of available TOC values for mixed K011/K013 and K011/K013/K014 streams. At the same time, the Agency acknowledges that wet air oxidation is effective in treating wastewaters containing up to 10 percent organic concentrations. USEPA, Proposed Best Demonstrated Available Technology (BDAT) Background Document for K011, K013, K014 (Addendum) November 1989 (hereinafter "K011, K013, K014 Addendum") at 13. For all practical purposes, aqueous K011/K013/K014 streams in the 3.5 to 10 percent TOC range are no different from the large volume aqueous wastes with low Btu content for which the Agency has determined incineration to be inappropriate. Id. at 34.

COMMENT NUMBER: 24A (CONTINUED)-5
DOCKET NUMBER: LD12-00219
COMMENTER: BRYAN, CAVE, McPHEETERS & McROBERTS
ISSUE: K011,13,14 - Acrylonitrile
SUBISSUE: Wastewater Definition
COMMENT:

The proposed TOC threshold would have the unfortunate and unnecessary effect of reducing the incentive for acrylonitrile producers to reduce their wastewater volumes. Acrylonitrile producers faced with the need to treat their wastewaters will have a strong economic incentive to reduce wastewater volumes, thereby facilitating the construction and operation of a smaller treatment system. Because reductions in wastewater volume can result in increases in TOC content, even if the hazardous constituent loadings are simultaneously reduced, wastewater reduction efforts may convert the waste stream from a wastewater to a "nonwastewater" subject to a June 8, 1991, prohibition and treatment requirements based on incineration. Apart from the economic advantages afforded by a smaller treatment system for a smaller waste stream, wastewater reduction offers positive environmental benefits. A reduced volume of wastewater treated to the BDAT standards represents a reduction in the mass of hazardous constituents ultimately disposed.

To facilitate these benefits, the Group recommends that the Agency establish an 10 percent TOC threshold for K011/K013/K014 wastewaters. A 10 percent threshold would allow producers to decrease their wastewater volume by half, which would increase the maximum TOC concentrations to the range of 7 to 10 percent without changing the regulatory status of the waste stream.

Comment Number: 24-A-5

Docket Number: LD12-00219

Commenter: Bryan, Cave, McPheeters, & McRoberts

Issue: Acrylonitriles (K011, K013, K014)

Subissue: Wastewater Definition

Response:

The Agency identified incineration as BDAT for K011/K013/K014 nonwastewaters in the Second Third rulemaking (54 FR 26594, June 23, 1989), basing its identification on performance data for incineration of K011/K013/K014 sludge that had resulted from allowing as-generated K011/K013/K014 wastes to settle in a settling basin. The K011/K013/K014 sludge was the bottoms (underflow) stream from the settling basin. This waste consisted of 17 to 31 percent TOC and approximately 10 to 40 percent TSS.

Since making the determination of BDAT for K011/K013/K014 nonwastewaters in the proposed rule, the Agency has collected additional data regarding K011/K013/K014 waste characterization and treatment; these additional data are reported in the following table. The waste characterization for K011/K013/K014 shows that many as-generated K011/K013/K014 wastes consist of between 1 percent and 3 percent by weight total organic carbon and less than 1 percent by weight total suspended solids.

The Agency does not believe that incineration is BDAT for most as-generated K011/K013/K014 wastes because of the large volume and low Btu content of those wastes. It would require extensive amounts of energy and incineration capacity to incinerate those aqueous wastes. However, the K011/K013/K014 as-generated wastes are ideal candidates for wet air oxidation because of the relatively low organic content (compared to most incinerated wastes), low TSS, and aqueous nature. Additionally,

Comment Number: 24-A-5 (continued)
Docket Number: LD12-00219
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Wastewater Definition
Response:

EPA has treatment performance data for only wet air oxidation for the K011/K013/K014 wastes as-generated. EPA does not have performance data for wastes defined as wastewaters by the original BDAT definition (i.e., less than 1% TOC and less than 1% TSS).

The Agency is proposing to extend the definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS so that the wet air oxidation data can be used to develop standards (rather than designate incineration as the BDAT). The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience. Therefore, the Agency will not promulgate a wastewater cutoff level of 10 percent TOC.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

Source	Total organic carbon (TOC) (mg/l)	Waste Matrix
Tischler/Kocurek	20,488	K011/K013
Tischler/Kocurek	13,659	K011/K013
Tischler/Kocurek	15,024	K011/K013
Tischler/Kocurek	18,244	K011/K013
BP July 18, 1989	20,700	K011/K013/K014
BP July 18, 1989	20,600	K011/K013/K014
BP July 18, 1989	22,300	K011/K013/K014
BP July 18, 1989	14,800	K011/K013/K014
BP July 18, 1989	30,000	K011/K013
BP July 18, 1989	20,000	K011/K013/K014
BP November, 1989	24,000	K011/K013
BP November, 1989	23,400	K011/K013
BP November, 1989	23,100	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
BP November, 1989	26,000	K011/K013
BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
BP November, 1989	23,600	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$99.9\text{th percentile TOC} = \exp(\bar{y} + Z_{99.9} Sy) = \exp(10.01 + 3.0 \times 0.205) \approx 42{,}000$$

where:

$y = \ln X$

$\underline{X}$ = TOC (mg/l)

y = average log TOC

Sy = standard deviation log TOC

$Z_{99.9}$ = 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

Comment Number: 24-A-6
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, 13, 14
Subissue: Wastewater Definition
Comment:

1. Proposed "Wastewater" Threshold

The Group understands that EPA is considering defining K011/K013/K014 wastewater by establishing an upper limit for TOC concentration that is higher than the generic 1 percent concentration that has been used in other BDAT rules. This approach is consistent with the Agency's waste-specific wastewater definition for K104. The Group's concern is that the suggested 5 percent upper limit for TOC may hinder efforts by producers to reduce the volume of their wastestreams, since the increases in TOC content that result from such volume reductions may shift the wastestream into a nonwastewater category for which incineration would be the applicable technology.

In the acrylonitrile manufacturing process, there are several sources of process water that may be able to be reduced, but cannot be eliminated. It may be possible to reduce water discharge from the acrylonitrile process by finding ways to increase the recycling and reuse of absorber water, quench water, and stripping steam. If such recycle/reuse of water is successful, however, the concentration of soluble organic constituents (as measured by TOC) in the process wastewater that must be treated with increase to levels approaching the solubility limits of the various organic constituents. Theoretically, it may be possible to decrease the wastewater volume by 50 percent or more, which would increase the maximum TOC concentrations to the range of 7 to 8 percent for K011/K013/K014 wastewater.

When acrylonitrile producers must apply BDAT to the listed wastewaters, there will be strong economic incentive to reduce wastewater volumes. This will allow the construction and operation of a smaller treatment system. The decrease in volume treated and disposed of is also a positive environmenta benefit. Since a reduced volume of wastewater treated to the BDAT standards represents a reduction in the mass of hazardous constituents that is subsequently disposed of, there is a net environmental benefit that will result from hydraulic reduction. Therefore, the Group urges EPA to identify the listed acrylonitrile wastewaters as wastes containing less thar or equal to 8.0 percent TOC and less than 1.0 percent of total suspended solids.

Comment Number: 24-A-6
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, K013, K014
Subissue: Wastewater Definition
Response:

The Agency is proposing to extend the definition of wastewaters for K011/K013/K014 wastes to include wastes containing less than 5 percent TOC and less than 1 percent TSS so that the wet air oxidation data can be used to develop standards (rather than designate incineration as the BDAT). The Agency determined the upper limit of 5 percent based on a calculation of the 99.9th percentile for all the available TOC values for mixed K011/K013/K014 waste streams. Mixed waste streams have been used as the basis in the development of the nonwastewater and wastewater standards for reasons presented in the background document for K011/K013/K014. The calculation for the 99.9th percentile is presented in the following table. The actual value is 4.2 percent, but the Agency rounded to 5 percent for analytical convenience. Therefore, the Agency will not promulgate a wastewater cutoff level of 8 percent TOC.

Table A-1 Calculation of 99.9th Percentile of Total Organic Carbon (TOC) Content

Source	Total organic carbon (TOC) (mg/l)	Waste Matrix
Tischler/Kocurek	20,488	K011/K013
Tischler/Kocurek	13,659	K011/K013
Tischler/Kocurek	15,024	K011/K013
Tischler/Kocurek	18,244	K011/K013
BP July 18, 1989	20,700	K011/K013/K014
BP July 18, 1989	20,600	K011/K013/K014
BP July 18, 1989	22,300	K011/K013/K014
BP July 18, 1989	14,800	K011/K013/K014
BP July 18, 1989	30,000	K011/K013
BP July 18, 1989	20,000	K011/K013/K014
BP November, 1989	24,000	K011/K013
BP November, 1989	23,400	K011/K013
BP November, 1989	23,100	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	28,800	K011/K013
BP November, 1989	26,000	K011/K013
BP November, 1989	27,200	K011/K013
BP November, 1989	20,200	K011/K013
BP November, 1989	23,600	K011/K013
BP November, 1989	22,300	K011/K013
BP November, 1989	22,100	K011/K013
BP November, 1989	24,000	K011/K013
BP November, 1989	16,500	K011/K013

The original data are approximately normally distributed with a possible outlier (i.e., the 30,000 mg/l value). The log-transformed data are more normally distributed with no suspected outlier. Using log-transformed data, a 99.9th percentile estimate of TOC equaling 4.2 percent is obtained from the following equation:

$$\text{99.9th percentile TOC} = \exp\,(\bar{y} + Z_{99.9}Sy) = \exp(10.01 + 3.0 \times 0.205) \approx 42{,}000$$

where:
y = lnX
X = TOC (mg/l)
y = average log TOC
Sy = standard deviation log TOC
$Z_{99.9}$ = 99.9th percentile value of the standard normal variate.

Reference: Richard J. Gilbert. 1987.

COMMENT NUMBER: 24B-1
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Acrylonitrile Standard
COMMENT:

Monsanto is concerned, however, that the 0.06 mg/ℓ BDAT level set for acrylonitrile in wastewater may be much too severe. The limit is based on a limit-of-detection established by BP Corp. We urge the Agency to adopt the 0.478 mg/ℓ level proposed by the APG in an October 10, 1989 letter to the Agency. (Attachment A to these comments). In this action, the Agency should find that it serves little purpose to establish a BDAT level so low as to be unachievable. If the future practice of wet air oxidation demonstrates that a level lower than 0.478 mg/ℓ is achievable, BDAT can be reduced at that time.

Comment Number: 24-B-1
Docket Number: LD12-00116
Commenter: Monsanto
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and therefore, that the BP America data were better. The data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm. If this cannot be met, the Agency is willing to consider treatability variances.

COMMENT NUMBER: 24B-2
DOCKET NUMBER: LD12-00189
COMMENTER: Du Pont
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Acrylonitrile Standard
COMMENT:

Du Pont is concerned, however, that the Agency has used a very limited data base from which to derive its proposed BDAT standards. We believe that the proposed limits for acrylonitrile are much too low and such low concentrations may be the result of EPA's limited data base rather than a reflection of the long-term performance characteristics of wet air oxidation. We request that the Agency reevaluate the use of this limited data, and at least in the interim until more data may be collected, establish the acrylonitrile BDAT standard on the basis of the data supplied by American Cyanamid to establish a BDAT limit approahcing 0.65 ppm.

Comment Number: 24-B-2
Docket Number: LD12-00189
Commenter: DuPont
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and therefore, that the BP America data were better. The data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm. If this cannot be met, the Agency is willing to consider treatability variances.

COMMENT NUMBER: 24B-3
DOCKET NUMBER: LD12-00219
COMMENTER: BRYAN, CAVE, McPheeters & McRoberts
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Acrylonitrile standard
COMMENT:

III. THE PROPOSED BDAT LIMITS FOR ACRYLONITRILE IN K011/K013/K014 WASTEWATERS MAY BE UNACHIEVABLE.

The BDAT limit for acrylonitrile is based on 4 effluent samples from the BP Chemicals pilot plant, all of which had nondetectable concentrations of this chemical. The Group is concerned that this single set of data may not be representative of within-plant and between-plant variations in wastewater characteristics or of full-scale, long-term operation of wet oxidation. As a consequence, the BDAT limits developed from these data may be unachievable.

Of all the wet oxidation performance data submitted to EPA, only the BP data used to derive the proposed standards consistently showed nondetectable concentrations of acrylonitrile at detection limits of less than 0.1 mg/L. K011, K013, K014 Addendum at Table C-2. While this may be partially attributable to the design and operating conditions of the BP process and pilot plant as contrasted with the processes and units used in other tests, it could also be due to feed-specific characteristics and other uncontrollable factors. Significantly, the American Cyanamid wet oxidation performance data presented in the Table C-2 clearly demonstrate

COMMENT NUMBER: 24B (CONTINUED)-3
DOCKET NUMBER: LD12-00219
COMMENTER: BRYAN, CAVE, McPheeters & McRoberts
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Acrylonitrile Standard
COMMENT:

equivalent treatment to the BP process for all pollutants except for acrylonitrile. This suggests that the American Cyanamid influent may not be treatable to the proposed level.

To account for raw waste variability, the Group recommends that the Agency choose the higher of the available data points for acrylonitrile in setting the BDAT limit for this constituent. Use of the American Cyanamid treatment data would result in a BDAT limit of 0.65 ppm. K011/K013/K014 Addendum at 40, Table B-2. Even though the Agency has determined the American Cyanamid data to be nonhomogeneous with the BP data, K011/K013/K014 Addendum at 46, Table C-3, both data sets reflect a high level of treatment. Moreover, there is little benefit to be derived from setting the limit for acrylonitrile at 0.06. Because the BDAT limits EPA has established for the other constituents in the K011/K013/K014 wastewaters will result in complete treatment of these wastes, establishing a higher BDAT limit for acrylonitrile will not impair the effectiveness of the treatment standards.

If experience with full-scale treatment technology shows that lower concentrations of acrylonitrile are indeed achievable for most K011/K013/K014 wastewaters, the Agency may adjust the BDAT limit accordingly. In the meantime, the more representative standard produced by the Group's recommended approach would eliminate the need for companies to seek treatability variances, while at the same time providing for substantial treatment.

Comment Number: 24-B-3
Docket Number: LD12-00219
Commenter: Bryan, Cave, McPheeters & McRoberts
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and therefore, that the BP America data were better. The data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm. If this cannot be met, the Agency is willing to consider treatability variances.

Comment Number: 24-B-3 (continued)
Docket Number: LD12-00219
Commenter: Bryan, Cave, McPheeters & McRoberts
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

The Agency would also like to point out that the BP data is believed to be more difficult to treat. The BP data contains K014 which is more difficult to treat than K011 and K013 because it contains higher levels of organics than K011 and K013.

Comment Number: 24-B-4
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011,13,14 - Acrylonitrile
Subissue: Acrylonitrile Standard
Comment:

2. The proposed BDAT limits for acrylonitrile in K011/K013/K014 wastewaters may be unachievable.

The BDAT limit for acrylonitrile is based on four effluent samples from the BP Chemicals pilot plant, all of which had nondetectable concentrations of this chemical. The Group is concerned that this single set of data may not be representative of within-plant and between-plant variations in wastewater characteristics or of full-scale, long-term operation of wet oxidation. As a consequence, the BDAT limits developed from these data may be unachievable.

Of all the wet oxidation performance data submitted to EPA, only the BP data used to derive the proposed standards consistently showed nondetectable concentrations of acrylonitrile at detection limits of 0.02 mg/L (K011, K013, K014 Addendum at Table C-2). While this may be partially attributable to the design and operating conditions of the BP process and pilot plant as contrasted with the processes and units used in other tests, it could also be due to feed-specific characteristics and other uncontrollable factors. The BP pilot plant was fed from a well mixed batch storage tank so that the process could attain steady state. The feed to the storage tank was a grab sample, which represented a one-half hour period of operation of the acrylonitrile operation at the Lima facility and less than six hours of operation at the Green Lake facility. Thus, the variability of the process effluent represented a wet air oxidation system fed a constant waste stream. The pilot plant's operation was more frequently monitored by more highly skilled operators (i.e., engineers) than would be expected a even a well operated commercial scale facility, which further limited the effluent variability. As a result, the variability factor derived by EPA' methodology is inappropriate to apply even to BP Chemicals full scale operation.

All of the acrylonitrile effluent concentration measurements from the BP pilot plant were below the detection limit of 0.02 mg/l. The Agency applied a 2.8 variability factor based upon its method for calculating variability factors for waste constituents that are all measured below the detection limit. As explained in a data submittal by the Ad Hoc Acrylonitrile Producers UIC Group, submitted on May 2, 1989, this methodology is unsupported by technical data and may underestimate the true variability.

Comment Number: 24-B-4 (cont.)
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011,13,14
Subissue: Acrylonitrile Standard
Comment:

To arrive at a variability factor of 2.8, the Agency assumed that the data below the detection limit are lognormally distributed within one order of magnitude. Data used for the development of the OCPSF effluent limitation guidelines variability factors often showed two orders of magnitude of variation in effluent quality for specific chemicals when the mean concentration of the data set was at or below the analytical detection limit. In the solvents and dioxin rulemaking, EPA developed and used an average variability factor of 5.34 to apply to those constituents reported in incineration residues as below detection limits and for some constituents used a variability factor of 9.05. If the Agency continues to rely solely on four data points that are all below the analytical detection limit, surely the variability factor should be adjusted.

Since the pilot operational data is a limited data set, the Agency should include the American Cyanamid wet air oxidation performance data presented in Table C-2 for establishing effluent limits for acrylonitrile. The performance data presented in Table C-2 clearly demonstrate equivalent treatment to the BP process for all pollutants except for acrylonitrile. Our review of the BP process data, obtained under a secrecy agreement with BP Chemicals, does not convince us that their process conditions will result in consistently low effluent concentrations for acrylonitrile. Our experience, which is consistent with the comments submitted by the Ad Hoc Acrylonitrile Producers UIC Group (Comment submitted in May, 1989), indicate that the destruction of specific organic compounds (acrylonitrile, acrylamide, acetonitrile) by wet air oxidation is highly variable and is not easily controllable by changing reactor conditions. This suggests that EPA should not automatically reject treatability data that exhibit high variability, since this appears to e an inherent characteristic of the process and this wastewater matrix.

To account for raw waste variability, we recommend that the Agency choose the higher of the available data points for acrylonitrile in setting BDAT limit for this constituent. Use of the American Cyanamid treatment data would result in a BDAT limit of 0.65 ppm (K011/K013/K014 Addendum at 40, Table B-2). Even though the Agency has determined the American Cyanamid data to be nonhomogeneous with the BP data (K011/K013/K014 Addendum at 46, Table C-3), both data sets reflect a high level of treatment.

Moreover, there is little benefit to be derived from setting the limit for acrylonitrile at 0.06 ppm. Because the BDAT limits EPA has established for the other constituents in the K011/K013/K014 wastewaters will result in complete treatment of these wastes, establishing a higher BDAT limit for acrylonitrile will not impair the effectiveness of the treatment standards.

Comment Number: 24-B-4 (Cont.)
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011, 13, 14
Subissue: Acrylonitrile Standard
Comment:

If experience with full-scale treatment technology shows that lower concentrations of acrylonitrile are indeed achievable for most K011/K013/K014 wastewaters, the Agency may adjust the BDAT limit accordingly. In the meantime, the more representative standard produced by the Group's recommended approach would eliminate the need for companies to seek treatability variances, while at the same time providing for substantial treatment.

Comment Number: 24-B-4
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

It is expected that in normal operation of a well-designed and well-operated treatment system, there will be some variability in performance. Based on the test data, a measure of this variability is expressed by the variability factor. The methodology for calculating variability factors is explained in the BDAT Methodology document.

In instances where a selected constituent was not detected in the treated waste, the treated value for that constituent was assumed to be at the detection limits. For example, acrylonitrile was not detected in the treated wastewater effluent, hence concentration values were set at the detection limit. According to the methodology document, when all treated values of a waste are at the detection limit, the variability factor is 2.8. Therefore, the variability factor for acrylonitrile was fixed at 2.8 as justified in the methodology document.

In the solvents and dioxin rulemaking, EPA developed and used average variability factors ranging from 2.10 to 6.17. The Agency used such average variability factors because it believed there were insufficient data sets to develop variability factors; in these cases, EPA used a variability factor that represented the average of the variability factors from available data sets.

The Agency believes that sufficient data were available for treatment performance of K011/K013/K014, and, consistent with the methodology appearing in the Methodology for Developing BDAT Treatment Standards, EPA is using a variability factor of 2.8.

Comment Number: 24-B-4 (continued)
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Acrylonitrile Standard
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and that the BP data is the best treatment data. The BP data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm.

COMMENT NUMBER: 24C-1
DOCKET NUMBER: LD12-00219
COMMENTER: BRYAN, CAVE, McPheeters & McRoberts
ISSUE: K011, 13, 14 - Acrylonitriles
SUBISSUE: Performance data
COMMENT:

I. THE GROUP SUPPORTS THE AGENCY'S USE OF PERFORMANCE DATA FROM THE TREATMENT OF ACRYLONITRILE WASTES IN SETTING TREATMENT STANDARDS FOR K011/K013/K014 WASTEWATERS.

The Group commends the Agency for its use of performance data from the treatment of acrylonitrile wastes rather than data from the treatment of dissimilar wastes. In addition, the Group agrees with the Agency's decision to base the standards on performance data from the treatment of the mixed K011/K013/K014 streams. The Group further supports the Agency's conclusion that biological treatment and incineration are inapplicable for these wastes.

Comment Number: 24-C-1
Docket Number: LD12-00219
Commenter: Bryan, Cave, McPheeters & McRoberts
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Performance Data
Response:

The Agency acknowledges the commenter's agreement on this issue.

COMMENT NUMBER: 24D-1
DOCKET NUMBER: LD12-00098
COMMENTER: BP AMERICA
ISSUE: K011, K013, K014 - Acrylonitriles
SUBISSUE: Numerical Standard vs Wet Air Oxidation
COMMENT:

XI. ACRYLONITRILE WASTES TREATABILITY GROUP (K011/K013/K014)

1. **BP Chemicals supports the selection of wet air oxidation (WAO) alone as BDAT for the K011, K013 and K014 treatability group.**

WAO, like incineration, is very effective at treating organic and cyanide-containing aqueous wastes. EPA has data from a pilot-scale demonstration WAO unit that shows excellent treatment performance. The efficacy of WAO on organics and cyanides and its availability make it the clear choice for BDAT.

Previous data and information submitted by BP Chemicals and the Ad Hoc Acrylonitrile Producers UIC Group demonstrated that the BDAT system originally proposed by EPA was unworkable and arbitrary, and not justified. As discussed in previous comments K011/K013/K014 is a complex waste matrix that is difficult to treat. Transfer of performance data from other wastes is inappropriate for this waste group. Given that all producers of acrylonitrile of deepwell inject process wastewater, treatment by WAO alone followed by deepwell injection of the high-salt content

COMMENT NUMBER: 24D (CONTINUED) - 1
DOCKET NUMBER: LD12-00098
COMMENTER: BP AMERICA
ISSUE: K011,13,14 - Acrylonitrile
SUBISSUE: Numerical standard vs. Wet air oxidation
COMMENT:

wastewater is extremely protective of human health and the environment.

BP Chemicals urges EPA to review the procedure used to derive variability factors (VF) that are used to calculate BDAT standards. The use of only four data points from pilot-scale demonstration tests skews the VF lower for several reasons. A pilot plant is well manned and often operated hands-on by engineers and supervisory personnel. As such, performance can be more "fine tuned" than in a commercial operation which has less staff and more reliance on automatic process control systems. Also, the pilot plant was fed from a well mixed batch storage tank. Thus, the variability of the process effluent data represents a WAO system fed a constant waste stream. As a result, the VF derived by EPA's methodology will be artificially low. Variability data from full-scale WAO units treating similar wastes should be evaluated by EPA and considered in setting BDAT for K011/K013/K014 wastewater.

Comment Number: 24-D-1
Docket Number: LD12-00098
Commenter: BP America
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Numerical Standard vs. Wet Air Oxidation
Response:

It is expected that in normal operation of a well-designed and well-operated treatment system, there will be some variability in performance. Based on the test data, a measure of this variability is expressed by the variability factor. The methodology for calculating variability factors is explained in the BDAT Methodology document.

In instances where a selected constituent was not detected in the treated waste, the treated value for that constituent was assumed to be at the detection limits. For example, acrylonitrile was not detected in the treated wastewater effluent, hence concentration values were set at the detection limit. According to the methodology document, when all treated values of a waste are at the detection limit, the variability factor is 2.8. Therefore, the variability factor for acrylonitrile was fixed at 2.8 as justified in the methodology document.

COMMENT NUMBER: 24 D-2
DOCKET NUMBER: LD12-00216
COMMENTER: B P CHEMICALS
ISSUE: K011, 13, 14 - Acrylonitrile
SUBISSUE: Numerical standards vs. wet air oxidation method
COMMENT:

A. ACRYLONITRILE WASTES TREATABILITY GROUP (K011/K013/K014)

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COMMENT NUMBER: 24D-2
DOCKET NUMBER: LD12-00216
COMMENTER: B P CHEMICALS
ISSUE: K011,13,14 - Acrylonitrile
SUBISSUE: Numerical standard vs. wet air oxidation method
COMMENT:

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Comment Number: 24-D-2
Docket Number: LD12-00216
Commenter: BP Chemicals
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Numerical Standard vs. Wet Air Oxidation
Response:

It is expected that in normal operation of a well-designed and well-operated treatment system, there will be some variability in performance. Based on the test data, a measure of this variability is expressed by the variability factor. The methodology for calculating variability factors is explained in the BDAT Methodology document.

In instances where a selected constituent was not detected in the treated waste, the treated value for that constituent was assumed to be at the detection limits. For example, acrylonitrile was not detected in the treated wastewater effluent, hence concentration values were set at the detection limit. According to the methodology document, when all treated values of a waste are at the detection limit, the variability factor is 2.8. Therefore, the variability factor for acrylonitrile was fixed at 2.8 as justified in the methodology document.

Comment Number: 2A-D-3
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011,13,14
Subissue: Numerical Std VS. WAO
Comment:

2. The proposed BDAT limits for acrylonitrile in K011/K013/K014 wastewaters may be unachievable.

The BDAT limit for acrylonitrile is based on four effluent samples from the BP Chemicals pilot plant, all of which had nondetectable concentrations of this chemical. The Group is concerned that this single set of data may not be representative of within-plant and between-plant variations in wastewater characteristics or of full-scale, long-term operation of wet oxidation. As a consequence, the BDAT limits developed from these data may be unachievable.

Of all the wet oxidation performance data submitted to EPA, only the BP data used to derive the proposed standards consistently showed nondetectable concentrations of acrylonitrile at detection limits of 0.02 mg/L (K011, K013, K014 Addendum at Table C-2). While this may be partially attributable to the design and operating conditions of the BP process and pilot plant as contrasted with the processes and units used in other tests, it could also be due to feed-specific characteristics and other uncontrollable factors. The BP pilot plant was fed from a well mixed batch storage tank so that the process could attain steady state. The feed to the storage tank was a grab sample, which represented a one-half hour period of operation of the acrylonitrile operation at the Lima facility and less than six hours of operation at the Green Lake facility. Thus, the variability of the process effluent represented a wet air oxidation system fed a constant waste stream. The pilot plant's operation was more frequently monitored by more highly skilled operators (i.e., engineers) than would be expected a even a well operated commercial scale facility, which further limited the effluent variability. As a result, the variability factor derived by EPA' methodology is inappropriate to apply even to BP Chemicals full scale operation.

All of the acrylonitrile effluent concentration measurements from the BP pilot plant were below the detection limit of 0.02 mg/l. The Agency applied a 2.8 variability factor based upon its method for calculating variability factors for waste constituents that are all measured below the detection limit. As explained in a data submittal by the Ad Hoc Acrylonitrile Producers UIC Group, submitted on May 2, 1989, this methodology is unsupported by technical data and may underestimate the true variability.

Comment Number: Z4-D-3 (cont)
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011, 13, 14
Subissue: Numerical Std. Vs. WAO
Comment:

To arrive at a variability factor of 2.8, the Agency assumed that the data below the detection limit are lognormally distributed within one order of magnitude. Data used for the development of the OCPSF effluent limitation guidelines variability factors often showed two orders of magnitude of variation in effluent quality for specific chemicals when the mean concentration of the data set was at or below the analytical detection limit. In the solvents and dioxin rulemaking, EPA developed and used an average variability factor of 5.34 to apply to those constituents reported in incineration residues as below detection limits and for some constituents used a variability factor of 9.05. If the Agency continues to rely solely on four data points that are all below the analytical detection limit, surely the variability factor should be adjusted.

Since the pilot operational data is a limited data set, the Agency should include the American Cyanamid wet air oxidation performance data presented in Table C-2 for establishing effluent limits for acrylonitrile. The performance data presented in Table C-2 clearly demonstrate equivalent treatment to the BP process for all pollutants except for acrylonitrile. Our review of the BP process data, obtained under a secrecy agreement with BP Chemicals, does not convince us that their process conditions will result in consistently low effluent concentrations for acrylonitrile. Our experience, which is consistent with the comments submitted by the Ad Hoc Acrylonitrile Producers UIC Group (Comment submitted in May, 1989), indicate that the destruction of specific organic compounds (acrylonitrile, acrylamide, acetonitrile) by wet air oxidation is highly variable and is not easily controllable by changing reactor conditions. This suggests that EPA should not automatically reject treatability data that exhibit high variability, since this appears to e an inherent characteristic of the process and this wastewater matrix.

To account for raw waste variability, we recommend that the Agency choose the higher of the available data points for acrylonitrile in setting BDAT limit for this constituent. Use of the American Cyanamid treatment data would result in a BDAT limit of 0.65 ppm (K011/K013/K014 Addendum at 40, Table B-2). Even though the Agency has determined the American Cyanamid data to be nonhomogeneous with the BP data (K011/K013/K014 Addendum at 46, Table C-3), both data sets reflect a high level of treatment.

Moreover, there is little benefit to be derived from setting the limit for acrylonitrile at 0.06 ppm. Because the BDAT limits EPA has established for the other constituents in the K011/K013/K014 wastewaters will result in complete treatment of these wastes, establishing a higher BDAT limit for acrylonitrile will not impair the effectiveness of the treatment standards.

Comment Number: Z4-D-3 (cont.)
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: K011, 13, 14
Subissue: Numerical Std vs. WAO
Comment:

If experience with full-scale treatment technology shows that lower concentrations of acrylonitrile are indeed achievable for most K011/K013/K014 wastewaters, the Agency may adjust the BDAT limit accordingly. In the meantime, the more representative standard produced by the Group's recommended approach would eliminate the need for companies to seek treatability variances, while at the same time providing for substantial treatment.

Comment Number: 24-D-3
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Numerical Standard vs. Wet Air Oxidation
Response:

It is expected that in normal operation of a well-designed and well-operated treatment system, there will be some variability in performance. Based on the test data, a measure of this variability is expressed by the variability factor. The methodology for calculating variability factors is explained in the BDAT Methodology document.

In instances where a selected constituent was not detected in the treated waste, the treated value for that constituent was assumed to be at the detection limits. For example, acrylonitrile was not detected in the treated wastewater effluent, hence concentration values were set at the detection limit. According to the methodology document, when all treated values of a waste are at the detection limit, the variability factor is 2.8. Therefore, the variability factor for acrylonitrile was fixed at 2.8 as justified in the methodology document.

In the solvents and dioxin rulemaking, EPA developed and used average variability factors ranging from 2.10 to 6.17. The Agency used such average variability factors because it believed there were insufficient data sets to develop variability factors; in these cases, EPA used a variability factor that represented the average of the variability factors from available data sets.

The Agency believes that sufficient data were available for treatment performance of K011/K013/K014, and, consistent with the methodology appearing in the Methodology for Developing BDAT Treatment Standards, EPA is using a variability factor of 2.8.

Comment Number: 24-D-3
Docket Number: LD12-L0153
Commenter: Cyanamid
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Numerical Standard vs. Wet Air Oxidation
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and that the BP data is the best treatment data. The BP data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm.

COMMENT NUMBER: 24E-1
DOCKET NUMBER: LD12-00087
COMMENTER: CYANAMID
ISSUE: K011/13/14 - Acrylonitriles
SUBISSUE: Data request
COMMENT:

IX. American Cyanamid will be submitting comments about the BDAT treatment for K011, K013, and K014 within 21 days of receiving information from BP Chemicals about the technology being used by the Agency to set the concentration levels.

The BDAT treatment levels proposed for K011, K013, and K014 wastewaters are based upon treatability data submitted by BP Chemicals as confidential business information. We are in the process of acquiring a confidential disclosure from BP Chemicals about the technology as it applies to acrylonitrile wastewaters and about the treatability studies conducted on K011, K013, and K014. We expect to obtain the package from BP Chemicals by the end of January and wish to reserve the right to comment even though the end of the comment period is January 8, 1990. We will provide comments to EPA within 21 days of receipt of the information from BP Chemicals. We feel this request for additional time to comment is consistent with the Agency's intent to allow comments to be submitted to the Agency within 21 days of the date that additional data are mailed to persons requesting to review data added to the RCRA docket during the comment period (54 FR 48392).

Questions concerning these comments should be directed to Dr. John Schneller at (504) 431-9511. We thank you for the opportunity to submit these comments and remain ready to work with the Agency to develop a good final regulation.

Comment Number: 24-E-1
Docket Number: LD12-0087
Commenter: Cyanamid
Issue: Acrylonitriles (K011, K013, K014)
Subissue: Data Request
Response:

The Agency acknowledges the commenter's request.

Comment Number: ZA-F-1
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, 13, 14
Subissue: Waste Variability
Comment:

2. Waste Variability

It is the Group's understanding that the Agency is considering setting treatment standards for K011/K013/K014 wastewaters based upon confidential treatability data submitted by BP Chemicals, Inc. In view of uncertainties as to the scale-up and availability of BP's proprietary wet oxidation technology, the Group is still reviewing the BP data to determine the extent to which it should be used. The Group hopes that these issues will be resolved during the comment period. In the interim, the Group would like to offer the following preliminary comments on the possible use of the BP data.

The Group is concerned that EPA may base the BDAT limits on pilot plant wet oxidation data collected by a single company using two process wastewater samples. Pilot testing of these wastewater samples cannot accurately represent the wide within-plant and between-plant variations in wastewater characteristics that have been demonstrated for the K011/K013/K014 wastewaters. The small number of sample analyses available cannot even provide a statistically significant estimate of wet oxidation process efficiency

Comment Number: 24-F-1 (cont.)
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters & McRoberts
Issue: K011, 13, 14
Subissue: Waste Variability
Comment:

variation. Therefore, the treatment process efficiency under the influence of wastewater characteristic variations and expected process variations is not reflected in the BP data. Because of this, the Group has questions as to the achievability of BDAT standards derived from the BP data.

The only way to better reflect the demonstrated waste variability in the BDAT limits is by incorporating additional data into the data base used to derive the standards. The Group recommends that EPA use the wet air oxidation data recently submitted to it by American Cyanamid to supplement the BP data. The recent American Cyanamid data (submitted by J. Schneller letter to M. Chatmon-McEaddy dated September 7, 1989) was collected following the EPA BDAT quality assurance/quality control protocols and should, therefore, be acceptable for the Agency to use in its BDAT analysis. Both series of treatability testing show approximately equivalent removals, with the BP data demonstrating higher removals of acetonitrile and acrylonitrile, and the American Cyanamid data showing greater removals of acrylamide and total cyanide.

The suggested approach is to average the mean constituent concentrations achieved by each of the two treatability tests, and to use these averages as the long-term average in EPA's BDAT methodology. These long-term averages would then be multiplied by the variability factors calculated from the BP data to obtain the BDAT limit for each hazardous constituent. The BP variability factor was used because there was an insufficient number of data points in the American Cyanamid data to use it to develop an alternative variability factor. The accompanying table shows BDAT limits derived from the combined data base, both with and without recovery correction of the analytical results.

Comment Number: 2A-F-1
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, 13, 14
Subissue: Waste Variability
Comment:

2. Waste Variability

It is the Group's understanding that the Agency is considering setting treatment standards for K011/K013/K014 wastewaters based upon confidential treatability data submitted by BP Chemicals, Inc. In view of uncertainties as to the scale-up and availability of BP's proprietary wet oxidation technology, the Group is still reviewing the BP data to determine the extent to which it should be used. The Group hopes that these issues will be resolved during the comment period. In the interim, the Group would like to offer the following preliminary comments on the possible use of the BP data.

The Group is concerned that EPA may base the BDAT limits on pilot plant wet oxidation data collected by a single company using two process wastewater samples. Pilot testing of these wastewater samples cannot accurately represent the wide within-plant and between-plant variations in wastewater characteristics that have been demonstrated for the K011/K013/K014 wastewaters. The small number of sample analyses available cannot even provide a statistically significant estimate of wet oxidation process efficiency

Comment Number: 24-F-1
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, K013, K014
Subissue: Waste Variability
Response:

It is expected that in normal operation of a well-designed and well-operated treatment system, there will be some variability in performance. Based on the test data, a measure of this variability is expressed by the variability factor. The methodology for calculating variability factors is explained in the BDAT Methodology document.

In instances where a selected constituent was not detected in the treated waste, the treated value for that constituent was assumed to be at the detection limits. For example, acrylonitrile was not detected in the treated wastewater effluent, hence concentration values were set at the detection limit. According to the methodology document, when all treated values of a waste are at the detection limit, the variability factor is 2.8. Therefore, the variability factor for acrylonitrile was fixed at 2.8 as justified in the methodology document.

In the solvents and dioxin rulemaking, EPA developed and used average variability factors ranging from 2.10 to 6.17. The Agency used such average variability factors because it believed there were insufficient data sets to develop variability factors; in these cases, EPA used a variability factor that represented the average of the variability factors from available data sets.

The Agency believes that sufficient data were available for treatment performance of K011/K013/K014, and, consistent with the methodology appearing in the Methodology for Developing BDAT Treatment Standards, EPA is using a variability factor of 2.8.

Comment Number: 24-F-1 (continued)
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, K013, K014
Subissue: Waste Variability
Response:

EPA has used the statistical method known as an analysis of variance (ANOVA) in determining the level of performance that represents the best treatment for acrylonitrile. Since the Agency has data from more than one wet air oxidation process, this method provides a measure of the differences between data sets. If the differences are not statistically significant, the data sets are said to be homogeneous.

If the Agency found that the levels of performance for one or more wet air oxidation processes are not statistically different (i.e., the data sets are homogeneous), EPA would average the long term performance values achieved by each wet air oxidation process and then multiply this value by the largest variability factor associated with any of the acceptable wet air oxidation processes. If EPA found that one process performs significantly better (i.e., the data sets are not homogeneous), BDAT would be the level of performance achieved by the best wet air oxidation process multiplied by its variability factor.

The Agency has performed such an ANOVA test for all the acrylonitrile data received prior to the proposed rule. This test is described in detail in the proposed addendum to the background document for K011, K013, and K014. The results of this ANOVA test show that the data sets were nonhomogeneous and that the BP data is the best treatment data. The BP data used to develop the 0.06 ppm standard for acrylonitrile are the best data available and therefore, the standard for acrylonitrile will remain at 0.06 ppm.

Comment Number: 24-F-1 (continued)
Docket Number: LD12-00116
Commenter: Bryan, Cave, McPheeters, & McRoberts
Issue: K011, K013, K014
Subissue: Waste Variability
Response:

The Agency disagrees with the commenter that the reason for using the BP variability factor was because of insufficient data points in the American Cyanamid data. The BP data and variability factors were used because the BP data represented best treatment.

If the treaters of these K011, K013, and K014 wastes still cannot meet the treatment standards, the Agency is willing to consider variance petitions.

ISSUE CODE 25: K015 - Still Bottoms from Benzal Chloride

A.-. Nickel Standard
B.-. Organic Standards

COMMENT NUMBER: 25-A-1
DOCKET NUMBER: LD12-00124
COMMENTER: ROLLINS ENVIRONMENTAL Services INC
ISSUE: K015 Wastewaters
SUBISSUE: Nickel Standard
COMMENT:

We also recommend that EPA review closely its proposed chromium, lead and nickel treatment standards for F024 (and K028). Those extremely low levels would probably effectively preclude the wastes from being accepted. Not only would the low levels prevent the waste from being co-burned with other wastes, but they would raise serious risks about the treatability of any subsequent incinerator clean-out ash and slag. The same applies to the identical nickel standard for K015.

COMMENT NUMBER: 25-A-1
DOCKET NUMBER: LD12-00124
COMMENTER: ROLLINS ENVIRONMENTAL
ISSUE: 25 - K015 Nonwastewaters
SUBISSUE: A - Nickel Standard
RESPONSE:

The Agency has received characterization data for nickel in untreated K015 waste during this comment period. According to the characterization data, untreated K015 has typical nickel values in the range of 1 to 11 ppm. EPA believes these data support the transfer of nickel standards from K048-K052 (wastes generated by the petroleum refining industry) where nickel values in untreated waste range from 0.025 to 392 ppm. The Agency has, however, recalculated nickel standards for K048-K052 and this standard, 0.2 ppm TCLP, will be transferred to nickel in K015 nonwastewaters.

COMMENT NUMBER: 25-A-2

DOCKET NUMBER: LD12-00116

COMMENTER: MONSANTO

ISSUE: K015 Wastewaters

SUBISSUE: Nickel Standard

COMMENT:

3. The Nickel BDAT Standard Should be Revised

Whatever determination the Agency makes on modifying the K015 treatment limits in keeping with the Variance Petition (above), it should at the very least revise the K015 BDAT treatment standard for Nickel upwards to 0.32 mg/l because:

- Estimated Nickel levels in K015 ash are much higher than K048-052 wastes and more similar to K101.
- The proposed Nickel transfer limit established for K048-052 is inappropriate and should not be transferred to K015 since:
    - The Nickel BDAT standard has been set inappropriately low.
    - The recomputed Nickel limit using EPA's limited data would still be unachievable.
- Background nickel levels in commercial incineration residues are also typically above K048-052 levels. K015 is burned with such wastes.

Each of the above is discussed below.

a. Estimated Nickel Levels in K015 Ash are Above K048-052 and More Similar to K101

The following are estimated Nickel levels in untreated ash:

K015 - estimated average 1,000 ppm, low values in the 50-600 range (see below: Nickel in K015).

K101 - average 276 ppm, range 261-297.[2]

K048-052 - average 68 ppm, range 51-80.[3]

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[1] The preamble to the proposed rule at 40453 incorrectly listed these metal limits as concentration (mg/kg) in ash. They should have been identified as TCLP extraction limits (mg/l). They are correctly listed in the proposed rule §268.41.

[2] K101/102 BDAT document at page 4-14.

[3] K048-052 BDAT document at pages 4-7 to 4-24 (Tables 4-2 to 4-7).

COMMENT NUMBER: 25-A-2 (Cont.)

DOCKET NUMBER: LD12-00116

COMMENTER: MONSANTO

ISSUE: K015 Wastewaters

SUBISSUE: Nickel Standard

COMMENT: Nickel in K015

The Agency has indicated in their November 22, 1989 proposal at FR 48452 that "no data exists characterizing metal concentrations in untreated K015 ash;...". Nickel levels in untreated ash can be estimated based upon the following data provided in the treatability variance petition referenced above.

- "Untreated K015 has typical Nickel values in the range of 1 to 11 ppm." Actual data are attached (Attachment G).
- Total ash concentrations average 0.5% and range up to 1.8%.

These data allow estimates for Nickel levels in untreated ash on the basis that substantially all the Nickel influent to the incinerator could be captured in the ash component[4]. Thus, if one takes the K015 mean raw waste concentration of 5 ppm Nickel, coupled with the average incinerator ash content of 0.5%[5], then Nickel concentration in the untreated ash would be of the order of 1000 ppm.[6]

Even combining the highest ash measured at 1.8% with raw waste concentrations in the range of 1 to 11 ppm, estimated Nickel concentrations of 56 to 610 ppm in the untreated ash would result.

The above K015 estimated Nickel levels in ash are above those for K048-052 and even somewhat above the range for K101 waste. Thus, use of technology transfer from K101 is more appropriate. Actually, this approach may be viewed as being conservative since the average Nickel concentration in ash for K015 at 1000 ppm is above the levels for K101 ash at 256 ppm.

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[4] For some incinerator configurations and operating conditions the Nickel or other metal component can partition into the air scrubber stream. In such cases these metals then become a component of the scrubber non-wastewater solids. They are then typically recombined with the ash and become a part of the total incinerator residues subjected to stabilization and land disposal. Final metal concentrations in the residue would be similar to those where the partitioning is solely to the ash.

[5] From the treatability Variance Petition at pages 13-14.

[6] $\frac{100\%}{0.5\%} \times 5$ ppm = 1000 ppm.

COMMENT NUMBER: 25-A-2
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: 25 - K015 Nonwastewaters
SUBISSUE: A - Nickel Standard
RESPONSE:

The Agency thanks the commenter for submitting characterization data for nickel in untreated K015 waste. According to the characterization data, untreated K015 has typical nickel values in the range of 1 to 11 ppm. EPA believes these data support the transfer of nickel standards from K048-K052 (wastes generated by the petroleum refining industry) where nickel values in untreated waste range from 0.025 to 392 ppm. The Agency has, however, recalculated nickel standards for K048-K052 and this standard, 0.2 ppm TCLP, will be transferred to nickel in K015 nonwastewaters.

COMMENT NUMBER: 25-B-1
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: K015 Wastewaters
SUBISSUE: Organic Standard
COMMENT:

2. Monsanto K015 Treatability Variance Petition Limits vs Third-Third Proposal

In the November 22, 1989 "Land Disposal Restrictions for Third scheduled Wastes; Proposed Rule" at FR 48452, EPA reproposed BDAT treatment standards for K015. In the preamble, the Agency reiterated their "no ash" recision: "After promulgation, a facility [Monsanto] generating K015 non-wastewater submitted information indicating that their K015 waste generated an ash residue upon combustion. Therefore, the Agency's assessments of these wastes not having an ash content was incorrect." However, in the K015 proposal for numerical treatment standards there is no indication that Monsanto's filed treatability variance petition was considered in the rule making.

The Monsanto variance petition utilized technology transfer, in keeping with EPA's principles and guidance, based upon K101/102 and K051 wastes. The following table compares EPA proposed treatment standards versus those incorporated into the petition.

BDAT TREATMENT STANDARDS FOR K015 NWW

Regulated Constituent	EPA Proposal 11/22/89		Monsanto Variance 2/9/89	
	Conc. Mg/kg	TCLP mg/l	Conc. mg/kg	TCLP mg/l
Anthracene	3.4		6.0	
Benzal Chloride	6.2		6.0	
Benzo(b/k)-fluoranthene	3.4		---	
Phenanthrene	3.4		6.0	
Toluene	6.0		6.0	
Benzyl Chloride	---		6.0	
Benzotrichloride	---		6.0	
Chromium (total)		1.7[1]		1.7
Nickel		0.048[1]		0.32

Monsanto concurs with the limits proposed for Benzal chloride, Toluene, and Chromium. However, Monsanto believes that the limits for Anthracene, Phenanthrene and Nickel should be adjusted in keeping with levels proposed in the petition. A similar value would also be expected for Benzo(b/k)fluoranthene as for the other organics.

Based on the above discussion, Monsanto requests that EPA amend the K015 non-wastewater treatment standards and make them consistent-with the Treatability Variance Petition filed 2/9/89.

COMMENT NUMBER: 25-B-1
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: K015 Wastewaters
SUBISSUE: Organic Standards
RESPONSE:

When the Agency has no performance data on treatment of a particular waste, it may decide to transfer data from treatment of another listed waste provided (1) the waste considered for transfer is sufficiently similar to the waste in question, and (2) the constituents to be regulated in the waste in question are present in lower concentrations than they are in the waste considered for transfer.

EPA has transferred the standards for anthracene, benzo(b/k)fluoranthene, and phenanthrene from the performance data from K087 (decanter tank car sludge from coking operations). The Agency believes this transfer is viable because (1) K087 is a waste which contains up to 30 percent BDAT organics and (2) in untreated K087, anthracene is present at 14,200 ppm, benzo(b/k)fluoranthene at 10,300 ppm, and phenanthrene at 43,200 ppm, while all three constituents are present in untreated K015 waste at levels below 5,000 ppm. EPA believes that the commenter's suggestion of using K101/K102 as a transfer source for K015 is not valid because K101/K102 are residues from the production of arsenic or organo-arsenic compounds. These wastes bear little similarity to K015, the still bottoms from benzyl chloride distillation. Additionally, the organic composition of K101/K102 is less than 20 percent which further confirms its inapplicability to be transferred to K015, a highly organic waste.

The Agency will, therefore, promulgate standards for anthracene, benzo(b/k)fluoranthene, and phenanthrene as proposed because on transfer of performance data from K087 wastes.

ISSUE CODE 26: K021 - Spent Antimony Catalyst

No Comments Were Received for this Waste Code

ISSUE CODE 27: K046 - WW Treatment Sludges from Manufacturing, Formulating, and Loading of Lead-Based Initiating Compounds

A. Treatment Standard
B. Stabilization Technology
C. Deactivation Technology
D. Waste Minimization
E. Analytical Data

Comment Number: 27-A-1
Docket Number: LD12-00273
Commenter: Department of the Army
Issue: K046
Subissue: Treatment Standard
Comment:

Reference Federal Register, Volume 54, Number 224, November 22, 1989, concerning Land Disposal Restrictions for Third Scheduled Wastes.

Lake City Army Ammunition Plant (LCAAP) is currently building two new wastewater pretreatment plants, an Explosive Wastewater Treatment Plant (EWTP) and a Pyrotechnic Wastewater Treatment Plant (PWTP), and retrofitting the Industrial Wastewater Treatment (IWTP). These plants were designed to pretreatment and categorical standards established at 40 CFR 403. The wastewater treatment processes utilize the latest wastewater treatment technology. For example, the EWTP process includes: dissolving leachable lead using sulfuric acid, chemically reducing the elemental lead with sodium sulfhydrate to form a stable lead sulfide precipitate, coagulating the precipitate using polymer, and finally filtering the wastewater with filter presses precoated with diatomaceous earth.

A pilot test study modeling the EWTP, PWTP, and the IWTP wastewater treatment processes determined the processes can reduce the lead concentration to a minimum of 0.052 mg/l. This concentration was determined through research by Wilson Laboratory and development testing and design by Black & Veatch Architects and Engineers, both experienced professional consulting engineering firms. Thus, it is not feasible to achieve a treatment standard of 0.037 mg/l with the best technologies currently available.

It is our considered opinion that treatment to a maximum 0.037 mg/l lead standard exceeds the technological capabilities currently available. It is recommended that the EPA adopt the 0.1 mg/l treatment standard used by the National Pollution Discharge Elimination System for lead, the Federal Water Pollution Control Act, Public Law 95-217, and the Missouri Clean Water Law, Chapter 204 R. S. Mo. Cum. Sup. 1982.

Process design information and test data can be made available for your review upon request. The point of contact is Mr. Gary Kelso, (816) 796-7159.

Comment Number: 27-A-1

Docket Number: LD12-00273

Commenter: Department of the Army

Issue: K046

Subissue: Treatment Standard

Response:

The Agency believes that reactive wastes, once deactivated will be no more difficult to treat than the nonreactive wastes for which treatment data are available. Chemical deactivation is demonstrated for reactive wastewater. Once the waste is deactivated it is classified as nonreactive wastewater. The BDAT for nonreactive wastewater is alkaline precipitation, settling and filtration.

The Agency believes that K046 wastewaters would be no more difficult to treat than mixed wastewater (K062, D007 and D008), in that the K046 wastewaters have lower concentrations of metals according to available characterization data (see Final Background Document; May 1990; Section 4, Performance data for the similar mixed waste). In order to verify the commenter's claim, the Agency requested design and test data on March 8, 1990 for treatment of reactive wastewaters from the commenter. No additional data or information were received from the commenter. Hence, the Agency is promulgating a treatment standard of 0.037 mg/l for lead for both reactive and nonreactive wastewaters. If treatability cannot be achieved by the commenter in a well-designed, well-operated system, then the commenter must provide data to prove nonachievability of the standards in an application for variance.

Comment Number: 27-B-1
Docket Number: LD12-00126
Commenter: IRECO Inc
Issue: K046
Subissue: Stabilization Technology
Comment:

Treatment Standard for K046, Wastewater Treatment Sludge From Manufacture and Processing of Lead-based Initiating Compounds.

In this rulemaking, EPA proposes to extend the treatment standard previously promulgated for nonreactive K046 to reactive K046. The treatment standard is based on a process disclosed in the background documents for "K046, nonreactive" and is apparently based on treatment of wastewater containing lead azide residues. There are, however, other lead-based initiating compounds such as lead styphnate; even if these compounds can be deactivated in a manner similar to deactivation of lead azide, it is unclear whether the residues so generated will be amenable to stabilization to the same level as that experienced in the study reported in the background document.

Comment Number: 27-B-1

Docket Number: LD12-00126

Commenter: IRECO Inc.

Issue: K046

Subissue: Stabilization Technology

Response:

The treatment standard is based on a process disclosed in the background document for K046 "nonreactive" nonwastewaters, based on treatment of nonwastewaters containing lead styphnate and not the "lead azide" as indicated by the commenter. The Agency is promulgating concentration-based standards for lead in the K046 waste. For the reactive subcategory nonwastewaters, the BDAT is deactivation followed by stabilization using Portland cement as a binder. The lead standard is based on data transferred from stabilization of a K046 nonreactive subcategory nonwastewater.

The background document states that compounds such as lead azide, lead styphnate and lead mononitroresorcinate can be deactivated using technologies such as chemical treatment or specialized incineration. The Agency believes that K046 reactive subcategory nonwastewaters, once deactivated, would be similar to the nonreactive nonwastewaters in terms of metals concentrations and other waste characteristics that would affect the selection of stabilization as treatment, and lacking evidence that would disprove this belief, EPA has determined that stabilization technologies are demonstrated for treating metals in K046 reactive subcategory nonwastewaters.

The TCLP extraction of the untreated waste was provided in the background document to compare the TCLP results of the untreated waste with the TCLP results of the treated waste (Table 4.1). From the comparison, it was determined that substantial treatment did occur, since the TCLP extract value was decreased from 103 mg/l to <0.01 mg/l of lead.

Comment Number: 27-B-1 (continued)

Docket Number: LD12-00126

Commenter: IRECO Inc.

Issue: K046

Subissue: Stabilization Technology

Response:

Therefore, the Agency believes that all reactive wastes, once deactivated, are similar and will be amenable to stabilization, to the same level as that experienced in the study reported in the background document.

Comment Number: 27-C-1
Docket Number: LD-12-00126
Commenter: IRECO INC.
Issue: K046
Subissue: Deactivation Technology
Comment:

Additionally, IRECO generates K046 contaminated with the molecular explosive tetracene, and we are uncertain at this time how tetracene will respond to the wastewater treatment and whether some additional form of deactivation may be necessary for this additional explosive. Perhaps this is a situation in which a site-specific variance request would be appropriate. Otherwise, we believe that the Agency should consider prescribing treatment methods (deactivation and stabilization) for the reactive subcategory of this waste.

COMMENT NUMBER: 27-C-1

DOCKET NUMBER: LD12-00126

COMMENTER: IREGO Inc.

ISSUE: K046

SUBISSUE: Deactivation Technology

RESPONSE:

The Agency believes that tetracene can be chemically deactivated since, tetracene is also a lead-based initiating compound in that they are expected to contain the same types of reactive ions that are amenable to chemical deactivation using different reagents. Deactivation can be accomplished using hot water bath and hydrogen sulfide. The reaction with tetracene forms a precipitate lead sulfide and a biodegradable species dissolved in wastewater. The sulfide reduces the nitro group to amine group. The amine group is biodegradable.

The Agency has promulgated chemical deactivation followed by alkaline precipitation, settling and filtration as the only identified demonstrated treatment for K046 reactive wastewater subcategory. This treatment is commercially available and provides substantial treatment, hence the treatment standard of 0.037 mg/l for lead in wastewaters in the reactive subcategory.

If treatability cannot be achieved by the commenter in a well-designed, well-operated system, then the commenter must provide data to prove nonachievability of the standards in an application for variance.

Comment Number: 21-D-1
Docket Number: LD12-00161
Commenter: SLSA
Issue: K046
Subissue: Waste minimization
Comment:

It is interesting to note that the successful stabilization scheme for K046 required a 1.2 to 1 ratio of cement to waste. This would have the effect of increasing the waste volume by at least 120%. Such a result would be contrary to EPA waste minimization goals and be violative of Congressional intent evidenced in the 1984 Hazardous and Solid Waste Act Amendments.

COMMENT NUMBER: 27-D-1

DOCKET NUMBER: LD12-00161

COMMENTER: SLSA

ISSUE: K046

SUBISSUE: Waste Minimization

RESPONSE:

Under the Hazardous and Solid Waste Amendments of 1984, Congress established the following national policy.

> "...wherever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored or disposed of, so as to minimize the present and future threat to human health and the environment."

At present, EPA has three waste minimization regulatory requirements, all of them promulgated in response to statutory requirements set forth in the (HSWA). They include:

(1) Certification by generators on their hazardous waste manifests that they have a program in place "to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable."

(2) Certification (to the above) in relation to any new permit issued to a TSDR for treatment, storage, or disposal of a hazardous waste, and

(3) As part of any generator's biennial report to EPA, a description of "the efforts undertaken during the year to reduce the volume and toxicity of the waste generated "as well as" charges in volume and toxicity of waste actually achieved during the years in question in comparison with previous years, to the extent such information is available for years prior to enactment of HSWA."

COMMENT NUMBER: 27-D-1 (continued)
DOCKET NUMBER: LD12-00161
COMMENTER: SLSA
ISSUE: K046
SUBISSUE: Waste Minimization
RESPONSE:

EPA would not interpret the addition of stabilizing agent to treat wastes as being contrary to the above requirements as suggested by the commenter, nor is it contrary to the statement of national policy. By stabilizing the lead in K046, EPA is requiring waste to be treated in a manner that minimizes future threats to human health and the environment. As such, EPA does not agree that compliance with the land disposal treatment standard will result in noncompliance of any waste minimization requirement or policy.

Comment Number: 27 - E - 1
Docket Number: LD12-00141
Commenter: SLSA
Issue: K046
Subissue: Analytical Data
Comment:

Furthermore, the data for this one set of results used to establish K046 BDAT is unreliable. In Table 4 - Z to the Background Document for K046, the TCLP result of the untreated waste for this sample was 103 mg/l of lead. It is, however, impossible to achieve 103 mg/l of extracted lead in the TCLP when the total content of the waste is 967 ppm. The TCLP has a built in dilution factor of 20. If the total lead content is 967 ppm, then the absolute maximum TCLP extract could be no higher than 48.35 mg/l, assuming 100% extraction by the TCLP, which never occurs. This fact alone should disqualify the only data point used to establish BDAT for K046.

COMMENT NUMBER: 27-E-1
DOCKET NUMBER: LD12-00161
COMMENTER: SLSA
ISSUE: K046
SUBISSUE: Analytical Data
RESPONSE:

The commenter has made reference to Table "4-Z"; it should be Table 4-1.

The TCLP extraction of the untreated waste was provided to compare the TCLP results of the untreated waste with the TCLP results of the treated waste. From this comparison it was determined that substantial treatment did occur, since the TCLP extract value was decreased from 103 mg/l to ≤ 0.01 mg/l.

The commenter correctly states that TCLP has a built-in dilution factor of 20. Therefore, he believes that the maximum the TCLP of the untreated waste could attain would be 48.35 mg/l. In this statement the commenter did not take into account that the untreated waste was a slurry containing ≤ 5 percent solids and not a sample containing 100 percent solids. The TCLP extraction procedure does have a 20:1 dilution of the solid material extracted. However, the original sample is filtered prior to solids extraction, and the filtrate is added back to the liquid extracted from the solids to form the TCLP extract for the total sample. Therefore, for this waste which contains approximately 90% liquid, it is entirely possible that a substantial portion of the lead was contained in the filtrate. Therefore, a simple division of 20 cannot be done to estimate the maximum possible TCLP value. The data are reliable and can be used to establish a treatment standard for K046.

ISSUE CODE 28: K060 - Ammonia Still Lime Sludge

No Comments Were Received for this Waste Code

ISSUE CODE 29: K061 - Electric Arc Furnace Dust

A.-. Wastewater Treatment Standard
B.-. High Temperature Metals Recovery and Residuals
C.-. Treatment Technologies for Nonwastewaters
D.-. Availability of High Temperature Metals Recovery

COMMENT NUMBER: 29-A-1
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

As discussed below, studies by NS&W's consultants, Yates and Auberle, Ltd., and a review of the available literature establishes that the transfer of K062 technology utilizing pH adjustment, chemical addition and clarification does not produce the same results for K061 wastewater. Treatment of K062 wastewater produces a lead hydroxide which readily forms a flock and settles in the clarifying facilities. K061 produces lead oxides which neither agglomerate in a clarification process nor settle nearly as readily. Therefore, U. S. EPA's proposed technology transfer is without basis in the record and would be arbitrary and capricious.

COMMENT NO.: 29-A-1
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the transfer of treatment performance data from the system treating the K062 composite to K061 wastewaters. All available K061 wastewater treatment data, as well as data for wastes similar to K061, were evaluated for this rulemaking. The Agency believes that the K062 data can be used to assess for K061 wastewaters the performance of these technologies (hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate).

EPA compared the two wastewaters (K062 and K061) with regard to characteristics that affect treatment performance and determined that a well-designed and well-operated treatment system should achieve similar or better performance on K061 wastewaters than on K062 wastewaters. Considered in this comparison were the settling characteristics of the precipitates formed from chemical precipitation. Specifically, the precipitate from the K062 treatment system was primarily a hydroxide while data on K061 indicate that solids will be in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials will not prevent effective treatment by the treatment train for K062 noted above. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The Agency is using these K062 data to promulgate the final standards for cadmium, chromium, and nickel in K061 wastewaters. The Agency determined, however, that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not

COMMENT NO.: 29-A-1 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

COMMENT NUMBER: 29-A-2
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

With respect to the standards for chromium, the model treatment would require adjustment of the pH to the level of approximately 2 in order to reduce the chromium and then readjustment of the pH to the optimum range of 9.2 for removal of lead and other heavy metals. Since the reduction in the pH is inconsistent with the operation of the existing system, it would result in a significant increase in dissolved solids, a significant increase in the sludge produced, and an unknown but potentially dilatorious impact on sludge characteristics. Thus the use of pH adjustment for chrome removal could interfere with carrying out BDAT for the sludge to meet the existing "First Third" limitations.

NS&W therefore proposes that the standards for K061 wastewater either be deleted or revised to merely specify that the technology now installed is BDAT or to specify numbers which that technology can be reasonably expected to achieve. If EPA declines to withdraw or revise the proposed standards for K061 wastewater, at a minimum, NS&W requests a two-year capacity variance in order to design and construct the facilities necessary to achieve the limits that can be met by current technology.

COMMENT NO.: 29-A-2
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency's evaluation of treatment performance data for K061 wastewaters included several types of treatment systems for different metal-bearing wastes. Included in this assessment were both K061 and other waste streams. However, there is a relative dearth of data for treatment of K061 wastewaters. In fact, even though the commenter frequently refers to his wastewater treatment system, he does not include treatment performance data to be considered in the final rulemaking.

The evaluation of treatment performance data addressed the use of hexavalent chromium reduction as a demonstrated treatment technology for K061 wastewaters. The Agency believes that K061 wastewaters may contain treatable concentrations of hexavalent chromium requiring reduction prior to precipitation. As a result, treatment standards for K061 wastewaters are being promulgated for total chromium. The Agency reiterates that any treatment method may be used to meet the treatment standards. In addition, the waste, as generated may not need hexavalent chromium reduction to meet the standards for total chromium.

The commenter points out that pH adjustment may be required for effective treatment. In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for hexavalent chromium reduction and precipitation of metals of concern.

COMMENT NO.: 29-A-2 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The commenter suggests that the proposed treatment standards be deleted or that a method of treatment be specified. Whenever possible, the Agency prefers to set a numerical treatment standard rather than specify a treatment method. The Agency can set a method of treatment as BDAT; however, that is usually only done when the constituent of concern cannot be analyzed in the treated residual. Because treatment performance data are available for wastes similar to K061 wastewaters, the Agency can transfer these data.

Therefore, the Agency is using these K062 data to promulgate the final standards for cadmium, chromium, and nickel in K061 wastewaters. The Agency determined, however, that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

COMMENT NUMBER: 29-A-3
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

As discussed at 54 Fed. Reg. 48456-7, K061 wastewater consists of several types of waste streams. These include leachate from landfills, dewatered sludges and CERCLA sites. The particular wastewater NS&W is concerned with here is the wastewater directly produced as a blowdown from the recycle of scrubber water used to scrub the fume from the stacks. These wastewaters are already regulated directly by U. S. EPA under the Clean Water Act at 40 C.F.R. Part 420, Subpart G. These standards were the result of extensive federal rule making, comments, judicial challenge and eventually settlement. The application of RCRA based regulations to these same flows prior to their discharge pursuant to NPDES permits or the federal pretreatment program is redundant and unnecessary. U. S. EPA, having already determined the proper level of treatment for these wastewaters, should exempt them from the RCRA standards proposed here.

COMMENT NO.: 29-A-3
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency agrees with the commenter's assessment of the types of operations that may generate K061 wastewaters, however, not all wastewaters generated from air pollution control scrubbers are classified as K061 wastewaters. The Agency recognizes that wastewaters generated as scrubber blowdown are not listed wastes, however, they may be "derived-from" wastes. Specifically, wastewaters generated from dewatering K061 sludges are K061 wastewaters by the "derived-from" rule. Wastewater streams other than wastewaters generated from K061 sludge dewatering are not K061 wastewaters. In addition, recycle streams from these operations are not regulated as K061 wastewaters. K061 wastewaters, such as leachates from mono-landfills, CERCLA sites, RCRA corrective actions, and wastewaters generated from dewatering K061 sludges from electric furnace air pollution control scrubbers, are required to meet the promulgated treatment standards prior to any type of land placement, including placement or treatment in surface impoundments. As a result, the Agency disagrees with the commenter's claim that these treatment standards are redundant or unnecessary.

COMMENT NUMBER: 29-A-4

DOCKET NUMBER: LD12-00152

COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

Basing the performance of a clarifier treating K061 dust on a clarifier treating K062 wastewater is inappropriate because of the difference in the physical and chemical properties of the suspended and dissolved solids in the influent to each clarifier. The solids in the K062 influent are primarily in the dissolved phase. A major process step in the BDAT for K062 wastewaters is the addition of lime or other alkali material to form insoluble metal hydroxides, which agglomerate into large floc particles. The high concentration of agglomerated hydroxide floc particles results in the type of settling known as "zone" settling. In zone settling, the particles settle as a zone or blanket, and there is a distinct interface between the settling particles and the liquid above the particles. The settling blanket of solids also acts as a filter to entrap smaller suspended particles that otherwise would not settle out of the liquid.

K061 consists of a substantially different particles than K062 waste. Lehigh University did an extensive study on the chemical and physical makeup of K061 dust and sludge. (Appendix 1)[1] This study found no substantial differences between particles from baghouses or scrubber systems. This study also concluded that K061 particles tend to be small and spherical with 15 per cent or more of the particles less than 1 micron in

COMMENT NUMBER: 29-A-4 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

diameter. Several electron microscope photographs showed the spherical particles to be hollow with some smaller particles inside them. These factors would tend to result in particles with low settling velocities.

The solids from scrubbers on electric arc furnaces do not settle as a blanket as the K062 waste does. The K061 particles settle as distinct particles with little agglomeration, which is referred to as "discrete" settling. Discrete settling offers no opportunity for entrapment of slower settling particles as is the case of zone settling.

An important difference between the two wastes is the pH of the wastewater. As stated above, alkaline material must be added to the K062 waste to precipitate the metals. Lime is used in electric arc furnaces resulting in a K061 wastewater with a pH that is often above 10. This is above that level which EPA suggests is the optimum pH range for metals precipitation. Adding acid to the K061 wastewater would not provide the same type of flocculating action that is provided by the addition of alkaline materials to the acidic K062 wastewater.

The Lehigh study determined that the particles were composed primarily of metal oxides, not hydroxides as is the case for K062 waste. This substantial difference in chemistry further makes technology transfer inappropriate. NS&W has collected and submitted to both the USEPA and Illinois Environmental Protection

COMMENT NUMBER: 29-A-4 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

Agency (IEPA) extensive data on its sludges in support of its Part B permit that clearly demonstrate that the two materials are chemically very different. This data shows similar metal concentrations, but very different concentrations of anions.

NS&W operates similar processes to collect the solids generated by the pickling operation and scrubbers. Both wastewaters are processed in clarifiers. The solids in each clarifier underflow are collected on vacuum filters. The sludge generated from the lime neutralization of the pickle liquor contains substantial concentrations of sulfates, while the concentrations of sulfate in the K061 sludge are significantly lower. Another difference between the two sludges is the moisture content; the lime neutralized pickle liquor sludge contains approximately 70-80% moisture, while the K061 sludge contains only 25-40% moisture. This indicates that there is substantial bonding between the solid particles in the lime neutralized pickle liquor sludge that entraps water. The moisture content in the K061 sludge is lower because there is very little bonding between the particles so moisture can not be entrapped.

COMMENT NO.: 29-A-4
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the transfer of treatment performance data from the system treating the K062 composite to K061 wastewaters. All available K061 wastewater treatment data, as well as data for wastes similar to K061, were evaluated for this rulemaking. The Agency believes that the K062 data can be used to assess for K061 wastewaters the performance of these technologies (hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate).

EPA compared the two wastewaters (K062 and K061) with regard to characteristics that affect treatment performance and determined that a well-designed and well-operated treatment system should achieve similar or better performance on K061 wastewaters than on K062 wastewaters. Considered in this comparison were the settling characteristics of the precipitates formed from chemical precipitation. Specifically, the precipitate from the K062 treatment system was primarily a hydroxide while data on K061 indicate that solids will be in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials will not prevent effective treatment of metals in K061 by the treatment train for K062 noted above. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The commenter points out that the pH of the two wastewaters may impact treatment performance. In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The

COMMENT NO.: 29-A-4 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for hexavalent chromium reduction and precipitation of metals of concern.

The Agency is using these K062 data to promulgate the final standards for cadmium, chromium, and nickel in K061 wastewaters. The Agency determined, however, that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

COMMENT NUMBER: 29-A-5

DOCKET NUMBER: LD12-00152

COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

In its assumption that transfer of K062 treatment technology to the treatment of K061 wastewaters is valid, the EPA has overlooked what could be the most important variable, pH. Most metals, and particularly lead, are insoluble only within a narrow pH range. Lead hydroxide reaches its minimum solubility of approximately 0.08 mg/L at a pH of 9.2. Changes from this optimum pH will increase the lead concentration significantly. For instance, at a pH of 10 the solubility of lead is 0.3 mg/L and at a pH of 8, the solubility is 10 mg/L.

COMMENT NO.: 29-A-5
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's point regarding the transfer of treatment performance data from K062 wastewaters. In addition to other parameters that affect treatment performance, the Agency considered the pH of the wastewaters in the evaluation of the transfer. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for precipitation of metals of concern.

The Agency agrees with the commenter's assertion that pH control is vital to effective treatment performance. In some cases, several precipitation steps with different pH may be needed to remove different metal constituents with incompatible solubilities.

COMMENT NUMBER: 29-A-6

DOCKET NUMBER: LD12-00152

COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

A major process step in the treatment of K062 wastewater is the reduction of hexavalent chromium. The chromium reduction process is enhanced by the low pH and low suspended solids in the influent to the process. The reaction rate of the chromium reduction process is dependent on the pH of the wastewater. A pH less than 2 is recommended for chromium reduction. This pH is typically found in the effluent from a pickle liquor operation.

The pH of K061 wastewater is alkaline which very significantly impacts the chromium reduction step. The high suspended solids in the K061 wastewater may also adversely affect the chromium reduction process. Therefore, the direct transfer of technology from K062 wastewater to K061 wastewater is inappropriate.

COMMENT NO.: 29-A-6
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency agrees with the commenter's statement that chromium reduction is most effectively performed at low pH. The Agency, however, disagrees with the commenter's point that the transfer of treatment performance data from K062 to K061 wastewaters is inappropriate. In fact, pH was considered in the evaluation of the data transferred from K062 to K061 to be used in promulgating treatment standards for cadmium, chromium, and nickel in K061 wastewaters. (Lead data were transferred from D008 because K061 wastewaters typically contain higher concentrations of lead than the K062 wastewater tested.) The treatment of cadmium, chromium, and nickel in K061 wastewaters can be performed effectively using the treatment system consisting of chromium reduction, chemical precipitation, and dewatering of the precipitate. The hexavalent chromium reduction step can be accomplished for K061 wastewaters with high pH through the addition of reagents (e.g., sulfuric acid) or other wastes to reduce the pH into the desirable range. Therefore, the pH of the untreated wastewater does not deter the waste from treatment, because it can be readily altered.

COMMENT NUMBER: 29-A-7
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

The differences in the chemical and physical properties between K062 and K061 particles results in substantial differences in the effluent quality from the clarifier operations. Since the publication of the proposed regulations regarding K061 wastewater, NS&W has been collecting data on the discharge from the clarifiers serving the electric arc furnace scrubber operation. These data, which are 24 hour composite samples, are presented in Table 1 and show an effluent quality different than the effluent from the K062 wastewater BDAT data. This is true even though the wastewater pH is maintained within the range (8-10) that EPA has suggested is the optimum for the treatment of K062 wastewater.

COMMENT NO.: 29-A-7
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency considered the settling characteristics of the precipitates from K062 treatment and K061 treatment in its evaluation of treatment performance data. The Agency recognizes that the precipitate from the K062 treatment system is primarily a hydroxide while data on K061 indicate that solids will be primarily in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials does not prevent effective treatment of K061 wastewaters. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The Agency could not include in its evaluation of K061 treatment data, the commenter's treatment system because treatment performance data were not included in Table 1 of the comment. The Agency attempted to obtain these treatment performance data, however, they were not submitted by the commenter for evaluation in the final rulemaking.

COMMENT NUMBER: 29-A-8
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

The assumption that K062 wastewaters are more difficult to treat than K061 wastewaters simply because K062 wastewater contains metal and solids concentrations higher than K061 wastewater ignores the different chemistry of the two wastewaters. This assumption is equivalent to requiring the effluent from a primary clarifier in a sewage treatment plant to comply with the same effluent criteria as the effluent from a secondary clarifier because the wastewater entering the secondary clarifier contains higher suspended solids concentrations.

The wastewater entering a secondary clarifier typically contains 800-3500 mg/L of suspended solids while the wastewater entering a primary clarifier contains approximately 250 mg/L. According to the theory proposed by the USEPA in the BDAT document for K061, the primary clarifier effluent would be the same or better than the secondary clarifier effluent. However, secondary clarifiers typically produce an effluent with less than 30 mg/L of TSS, while the effluent from a primary clarifier will typically contain greater than 100 mg/L of TSS. One reason for the difference in effluent quality is the nature of the solids in the influent to each type of clarifier. The solids in the influent to the secondary clarifier exhibit zone settling similar to K062 wastes, while the solids in the influent to the primary clarifier exhibit discrete settling similar to the K061 solids. The different performance characteristics of the two types of clarifiers has been well documented during the long history of municipal sewage treatment.

COMMENT NO.: 29-A-8
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's claim that K062 wastewaters are not more difficult to treat than K061 wastewaters. The K062 wastewaters that were treated by the system consisting of hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate, were well characterized with respect to parameters affecting treatment performance including concentrations of metals, oil and grease, and organic content of the waste (Envirite Report, 1987). The K062 data show high levels of metals, suspended solids, dissolved solids, and measurable concentrations of oil and grease. Available K061 wastewater characterization data describe a waste stream that can be effectively treated using the above-mentioned treatment technologies to levels equivalent to or below the K062 levels.

Specifically, K061 wastewaters typically contain low concentrations of dissolved metals (i.e., less than 100 ppm) while K062 wastewaters generally contain concentrations of dissolved metals (solids) in concentrations greater than 5,000 ppm. Specific metal concentrations were also considered in the comparison, and it was determined that untreated K062 (composite) has higher concentrations than K061: cadmium - 13 mg/l compared to 3.33 mg/l; chromium - 2,581 mg/l compared to 4.3 mg/l; nickel - 16,330 mg/l compared compared to 0.043 mg/l. Based on these data, the Agency believes that K062 wastewaters are more difficult to treat effectively than K061 wastewaters. Therefore, the Agency is using these K062 data to promulgate treatment standards for cadmium, chromium, and nickel in K061 wastewaters.

COMMENT NO.: 29-A-8 (continued)
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency determined, however, that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

COMMENT NUMBER: 29-A-9
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

The proposed Best Demonstrated Available Technology (BDAT) background document for K061 (addendum) was the sole justification on the record for imposition of proposed standards for K061 wastewaters. It seeks to characterize these wastewaters based on limited data from one facility previously submitted during the development of effluent guidelines. It seeks to extrapolate from treatment performance data for K062 wastewaters on the erroneous assumption that the waters are either comparable in chemical and physical characteristics or even more amenable to treatment. As demonstrated above, this is completely unwarranted by the available data. The use of limited data on K061 wastewaters based on one facility and the erroneous transfer of technology as demonstrated in the previous discussion completely undermines the basis for the background document. The simple fact is that NS&W operates a model treatment system as described in development documents for the treatment of metals, in particular lead, and cannot, even operating at optimum pH with chemical addition, achieve the standards that are proposed. (See Table 1) In the absence of additional information on the record, there is no basis, therefore, for basing these standards on the "Background Document."

COMMENT NO.: 29-A-9
DOCKET NUMBER: LD12-00152
COMMENTER: NORTHWESTERN STEEL AND WIRE COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment that the transfer of treatment performance data K062 to K061 was inappropriate or unwarranted. The Agency evaluated the limited data base for treatment of K061 wastewaters and similar wastewaters. As stated previously, the Agency evaluated the two wastes with regard to characteristics affecting treatment performance and determined that K061 wastes are more difficult to treat effectively using the treatment system consisting of hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate. These data are being used to promulgate treatment standards for cadmium, chromium, and nickel in K061 wastewaters. The Agency determined that other data sources should be evaluated for the transfer of lead data. For lead, the Agency is transferring treatment performance data from D008 wastewater treatment (chemical precipitation, flocculation, clarification, filtration, and sludge thickening) because K061 wastewaters typically contain higher concentrations of lead than the K062 wastewater tested. The D008 data were evaluated for treatment of lead and determined to be more difficult to treat than lead in K061.

The Agency reiterates that there is a relative dearth of treatment data for K061 wastewaters. The Agency could not include in its evaluation of K061 treatment data, the commenter's treatment system because treatment performance data were not included in Table 1 of the comment. In addition, the Agency attempted to obtain these treatment performance data, however, they were not submitted by the commenter for consideration in the final rulemaking.

COMMENT NUMBER: 29-A-10

DOCKET NUMBER: LD12-00142

COMMENTER: LONE STAR STEEL COMPANY

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

The EPA's categorization of EAF air pollution control scrubber blowdown and the wastewater generated from dewatered EAF air pollution control scrubber sludges as K061 wastewater is incorrect. See 54 Fed. Reg. 48,237, 48,458 (November 22, 1989) (Preamble); U. S. Environmental Protection Agency, Proposed Best Demonstrated Available Technology (BDAT) Background Document for K061 (Addendum) 2-1 (November 1989) [hereinafter K061 Wastewater Background Document]; see also Memorandum from Marvin Drabkin to Monica Chatmon-McEaddy 1 (May 16, 1989) (discussing "availability option for setting treatment standard for the wastewater form of K061 waste") [hereinafter Memorandum]. In short, RCRA regulations, including the promulgation of best demonstrated available technology ("BDAT") standards, the subject of the proposed regulations, are inapplicable to these wastewaters because they are not hazardous wastes. (See 40 C.F.R. Part 261, 1989). First, these wastewaters are not listed in 40 C.F.R. Part 261, Subpart D. Second, these wastewaters are not "derived from" a listed hazardous waste, K061. Third, these wastewaters do not exhibit any hazardous characteristics set forth in 40 C.F.R. §261, Subpart C. Because the Agency is relying upon the "derived-from" rule to classify these wastewaters as hazardous, Memorandum at 1, we will elaborate below on why this "derived from" rule is inapplicable to these wastewaters. First we will discuss why this rule is inapplicable because of the nature of the EAF air pollution control scrubber sludge dewatering process. Second, we will explain why even if the EPA did decide to regulate this material as hazardous under the "derived-from" rule, such regulation would be invalid as beyond the Agency's authority because of the absence of consideration of the statutorily required health and environmentally based criteria.

COMMENT NUMBER: 29-A-10 (continued)

DOCKET NUMBER: LD12-00142

COMMENTER: LONE STAR STEEL COMPANY

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

K061 sludge is generated when the solids present in EAF scrubber blowdown water are separated from the water by some method of filtration and fall into a container. The water removed from the sludge is returned to the wastewater system. Treated clarifier water is discharged through an NPDES outfall. The combined stream from the air pollution control equipment should not be considered the waste. The K061 sludge is not generated until the solids are removed from the wastewater. Therefore, water separated from the combined stream is not "derived-from" waste. This is consistent with EPA guidance, as described in the following paragraph.

COMMENT NUMBER: 29-A-10 (continued
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA currently is reconsidering the "derived from" rule, see, e.g., Shell Oil Co. v. EPA, No. 80-1532 (D.C. Dir.),[1] recognizing that application of the "derived from" rule absent the statutorily required consideration of health-based and environmental criteria[2] is inequitable and may make a "hazardous waste" out of material which is no threat to health or the environment. See, e.g., 40 C.F.R. §261.3 (allowing that for characteristic hazardous wastes, the "derived from" rule is inapplicable if the material no longer exhibits the characteristic); 54 Fed. Reg. 17,294 (1989) (stating Agency intent to make de minimis exception from rules); 46 Fed. Reg. 56,582 (1981) (exempting wastewaters from the "derived from" rule because the material was not a risk to human health or the environment "so that automatically defining these waste mixtures as hazardous is inappropriate"). See also 45 Fed. Reg. 33,095-96 (Agency stating application of mixture rule creates "inequities" because some mixtures will contain only very small amounts of listed hazardous waste and that some of these resulting substances will not threaten health or the environment). Given the Agency's reconsideration of its applications of the "derived-from" rule, the Company believes the Agency should not rely upon such an application in this case to classify the EAF air pollution control scrubber blowdown and the wastewater generated from dewatered EAF air pollution control sludges. Not only is this position inconsistent with EPA guidance, see supra Section 1(A), but also requires the Agency to disregard its misgivings about this type of application of the "derived-from" rule.

COMMENT NO.: 29-A-10
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the types of operations that may generate K061 wastewaters. K061 wastewaters can be generated from dewatering of K061 sludges generated from air pollution control scrubbers, however, not all wastewater streams generated from scrubbers are classified as K061 wastewaters. The Agency recognizes that wastewaters generated as scrubber blowdown are not listed wastes, however, they can be hazardous wastes by the "derived-from" rule.

The Agency agrees with the commenter's point that K061 sludge is not generated until the solids are separated from the wastewater. Specifically, wastewaters generated subsequent to K061 sludge generation, such as from dewatering K061 sludges, are K061 wastewaters by the "derived-from" rule. Wastewater streams other than wastewaters from K061 dewatering are not K061 wastewaters. These include recycle streams or wastewater discharges from clarifiers or other operations prior to the generation of the K061 sludge. All wastewater streams can be discharged under NPDES permits, however, K061 wastewaters generated from dewatering K061 sludges from electric furnace air pollution control scrubbers are required to meet the promulgated standards prior to any type of land placement, including placement or treatment in surface impoundments.

COMMENT NUMBER: 29-A-11
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

The K062 Wastewater BDAT Treatment Standards cannot be extrapolated properly to K061 Wastewater. EPA has assumed that spent pickle liquor (K062) and K061 wastewater are essentially the same, apparently since both contain metals and are generated by the iron and steel industry. Notwithstanding these two similarities, there are a variety of differences between these two waste streams which prevent ready transfer of K062 wastewater standards to K061. Further, EPA made this determination despite a lack of data. While EPA states that it compared the two wastewaters with regard to characteristics that affect treatment performance, it has no data for two of the three characteristics it said were evaluated, oil and grease and organic constituents. K061 Wastewater Background Document at 4-1.

Most importantly, EPA did not consider the characteristic likely to have the most profound effect on treatability, namely the pH of the two waters. The pH of a liquid waste stream has a direct effect on its treatability. First, the pH determines whether the metals will be primarily suspended particulate or dissolved. For low pH (acid) streams such as pickle liquor, the metals will be in solution. In alkaline waters, especially those in the pH range of approximately 8.0 to 10.5 s.u., the metals of interest to this study will have relatively low solubility levels. Second, the pH of a wastewater stream will determine whether addition of lime is necessary or even suitable for use in treatment. Lime is an alkaline material, so for an acid waste stream it is one of several reagents which can be used to raise the pH to the range which will decrease the solubility of the metals of interest. Adding lime to waste streams which are already alkaline, as would be expected with K061 wastewater, would raise the pH above the optimum pH range for metals removal. This would tend to resolubilize amphoteric metals such as lead.

EPA proposes chromium reduction as part of the treatment train for K061 wastewater, with no data or literature reference to support the contention that any chromium present in K061 wastewater will be present in the hexavalent form and therefore will require chromium reduction. K061 Wastewater Background Document at 3-1. This assumption is not valid:

COMMENT NUMBER: 27-A-11 (continued)
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

"Chromium compounds . . . from metallurgical uses [such as steel production in an EAF] are assumed to be in either the trivalent or zero-valent state . . . a typical dust analysis of an electric arc furnace reveals [the presence of trivalent] chromium, as Cr_2O_3." M. Sitting, Toxic Metals Pollution Control and Worker Protection 114 (1976).

EPA also states that waters which contain lower levels of metals are easier to treat than those with higher levels. 54 Fed. Reg. at 48,456. Generally, just the opposite is true. Metals are removed from wastewater by adjusting the pH to a range in which the metals are least soluble. Then the metals are removed by agglomerating the particles and allowing them to drop out of solution, or precipitate. Since larger particles will fall out easier than smaller particles, waters with more metals will have more particulate to agglomerate into larger particles. Thus, "dirtier" water often-is easier to treat.

The lowest treatment standard proposed by EPA is for lead. EPA reasoned that this standard is the same standard set for K062, and that the highest lead value reported for untreated K062 is greater than the highest lead value reported in the (extremely small) data base for what EPA has termed K061 wastewater. K061 Wastewater Background Document. However, a review of the two processes involved as well as a more thorough review of the data EPA does have reveals that waters associated with EAF emission controls are much more likely to contain lead than are waters from steel pickling. Lead is a volatile metal, present in feed materials to electric arc furnaces, where it tends to be removed in the emissions from the furnace rather than remaining in the steel. Therefore, when the steel is pickled, there is usually little lead present to be put into solution. The data in the K061 Wastewater Background Document supports this. See Tables 4-4 to 4-14. Only six (6) of the thirty-five (35) analyses for lead in untreated K062 had detectable levels of lead. In every case where lead was detected, the sample was a composite of K062 and non-K062 waste streams. Such a low standard has not been demonstrated to be technically feasible for K061 wastewaters, since the treatment and the waste to which K061 is compared when proposing the standard are so dissimilar.

COMMENT NUMBER: 29-A-11 (continued)
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

In conclusion, neither the K062 wastewater treatment methods nor the BDAT standards transfer to K061 wastewaters because of the differences in these materials. The K062 wastewater treatment cannot constitute BDAT for K061 wastewater because K062 wastewater treatment cannot be "demonstrated" successfully on K061 wastewater. In turn, the constituent specific concentrations established as BDAT for K062 wastewaters have no basis for application to K061 wastewaters. Therefore, EPA may not rely properly on K062 wastewater standards to set K061 wastewater standards.

COMMENT NO.: 29-A-11
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the transfer of treatment performance data from the system treating the K062 composite to K061 wastewaters. All available K061 wastewater treatment data, as well as data for wastes similar to K061, were evaluated for this rulemaking. The Agency believes that the K062 data can be used to assess for K061 wastewaters the performance of these technologies (hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate).

The commenter addresses the pH of wastewaters as being an important characteristic affecting treatment performance. In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for precipitation of metals of concern.

The evaluation of treatment performance data also addressed the use of hexavalent chromium reduction as a demonstrated treatment technology for K061 wastewaters. The Agency believes that K061 wastewaters may contain treatable concentrations of hexavalent chromium requiring reduction prior to precipitation. As a result, treatment standards for K061 wastewaters are being promulgated for total chromium. The Agency reiterates that any treatment method may be used to meet the treatment standards. In addition, the waste, as generated may not need hexavalent chromium reduction to meet the standards for total chromium.

COMMENT NO.: 29-A-11 (continued)
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

EPA, in its evaluation of the transfer of data from K062 to K061, compared the two wastewaters with regard to characteristics that affect treatment performance and determined that a well-designed and well-operated treatment system should achieve similar or better performance on K061 wastewaters than on K062 wastewaters. Considered in this comparison were the settling characteristics of the precipitates formed from chemical precipitation. Specifically, the precipitate from the K062 treatment system was primarily a hydroxide while data on K061 indicate that solids will be in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials will not prevent effective treatment by the treatment train for K062 noted above. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The K062 wastewaters that were treated by the system consisting of hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate, were well characterized with respect to parameters affecting treatment performance including concentrations of metals, oil and grease, and organic content of the waste (Envirite Report, 1987). The K062 data show high levels of metals, suspended solids, dissolved solids, and measurable concentrations of oil and grease. Available K061 wastewater characterization data describe a waste stream that can be effectively treated using the above-mentioned treatment technologies to levels equivalent to or below the K062 levels.

COMMENT NO.: 29-A-11 (continued)
DOCKET NUMBER: LD12-00142
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

Specifically, K061 wastewaters typically contain low concentrations of dissolved metals (i.e., less than 100 ppm) while K062 wastewaters generally contain concentrations of dissolved metals (solids) in concentrations greater than 5,000 ppm. Specific metal concentrations were also considered in the comparison, and it was determined that untreated K062 (composite) has higher concentrations than K061: cadmium - 13 mg/l compared to 3.33 mg/l; chromium - 2,581 mg/l compared to 4.3 mg/l; nickel - 16,330 mg/l compared compared to 0.043 mg/l. Based on these data, the Agency believes that K062 wastewaters are more difficult to treat effectively than K061 wastewaters. Therefore, the Agency is using these K062 data to promulgate treatment standards for cadmium, chromium, and nickel in K061 wastewaters.

The Agency determined, however, that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transfering treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

COMMENT NUMBER: 29-A-12

DOCKET NUMBER: LD12-L0044

COMMENTER: LONE STAR STEEL COMPANY

&dDISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

However, LSS does understand that—due to the sheer volume of items which are under review for land disposal restriction in the "third third" of regulated hazardous waste and the short time period with which to gather data—EPA has felt it necessary to extrapolate data from what it views as waste streams similar to those for which treatment standards are being written. Recognizing this, LSS is willing to submit data on its wastewater treatment system for EAF scrubber water. This data may be of limited use in establishing BDAT standards for K061 wastewater, particularly leachate from landfills containing K061 non-wastewaters. This is due in part to the length of time that it takes water to percolate through a landfill compared to the contact time in a high energy wet scrubber. Because of this, landfill leachate would be expected to contain a much higher ratio of dissolved to suspended solids. Different treatment methods may be necessary for waters high in dissolved metals compared to those low in dissolved metals. Additionally, the data we have seen for landfill leachate indicates that its pH is likely to be several units higher than Lone Star Steel's scrubber water. This, too, affects treatability as the higher pH of K061 landfill leachate is likely to require acid addition to obtain optimal pH for metals removal, while LSS scrubber water requires no pH adjustment.

Keeping the above items in mind, it is still reasonable to expect Lone Star Steel's EAF scrubber water to more closely resemble the chemistry of K061 wastewater than does K062, spent pickle liquor. For this reason, LSS is willing to submit data on its EAF scrubber water, regulated by EPA under NPDES Permit No. TXD0000027, Outfall 102.

In 1989, the NPDES regulated effluent from the EAF scrubber system was analyzed six times for the four metals lead, chromium, cadmium, and nickel. The results are listed below; metals are reported as total in mg/L.

Date	pH	Pb	Cd	Cr	Ni
01-04-89	9.1	2.6	0.04	0.40	0.05
01-10-89	9.7	2.6	0.05	0.51	0.05
01-17-89	9.7	3.0	0.07	0.50	0.05
04-12-89	8.7	1.8	0.18	0.23	<0.03
07-25-89	9.7	2.6	0.03	0.28	<0.03
12-28-89	10.0	2.9	0.06	0.40	<0.03

No influent data is available. However, in 1989, 5,406,316 pounds (dry weight basis) of solids were removed from the scrubber water. The K061 sludge averaged, on a dry weight basis, 2.0% PbO, 0.049% CdO, 0.24% Cr_2O_3 and 0.03% NiO.

COMMENT NO.: 29-A-12
DOCKET NUMBER: LD12-00044
COMMENTER: LONE STAR STEEL COMPANY
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency appreciates the commenter's submission of data for use in the Third Third Final Rule. The six data points for lead, cadmium, chromium, nickel, and pH from the air pollution control scrubber of an electric furnace were evaluated for use in determining the best demonstrated available technology for K061 wastewaters. The data submitted consist of effluent data from a treatment system of clarification and vacuum dewatering of solids. These data are not for K061 wastewaters (although they are similar with regard to characteristics) because they were not generated from dewatering K061 sludges. These data, however, were determined to be insufficient to evaluate the performance of the treatment system because only effluent data were supplied. As a result of the absence of influent waste characterization data, the Agency could not evaluate properly the effectiveness of the treatment system and include the data in the development of treatment standard for K061 wastewaters.

COMMENT NUMBER: 29-A-13
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA categorizes EAF air pollution scrubber blowdown and wastewaters generated from scrubber sludges as "K061 wastewaters" because they are "derived from" K061. However, as the Agency has recognized in the context of API separator wastewaters, the "derived from" rule is inapplicable to wastewaters generated from the clarification and dewatering of a hazardous waste sludge.

K061 sludge is generated when the solids present in EAF scrubber blowdown water are separated from the water by some method of filtration or sedimentation. The water removed from the sludge is normally returned to the scrubber system or discharged to a treatment system. Treated water is then discharged through an NPDES outfall. The water in this combined waste stream from the air pollution control equipment should not be considered K061. The K061 sludge which is the true waste is not generated until the solids are removed from the wastewater. Therefore, water separated from the combined stream is not "derived-from" waste.

COMMENT NO.: 29-A-13
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's statement that the "derived-from" rule is inapplicable to wastewater generated from air pollution scrubber blowdown. The Agency recognizes that wastewaters generated as scrubber blowdown from an electric furnace are not listed wastes, however, they may be "derived-from" wastes. Specifically, wastewaters generated from dewatering K061 sludges are K061 wastewaters by the "derived-from" rule. The commenter is correct in the statement that K061 sludge is not generated until the solids are removed from the blowdown wastewater. Wastewaters generated from dewatering operations subsequent to generation of the K061 sludge are K061 wastewaters and are subject to these treatment standards. K061 wastewaters are required to meet these treatment standards prior to any type of land placement, including placement or treatment in surface impoundments.

COMMENT NUMBER: 29-A-14
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

Because wastewaters from EAF scrubber blowdown and sludge dewatering are not "derived from" a hazardous waste, do not exhibit a hazardous characteristic, and are not listed hazardous wastes, they are beyond the scope of this rulemaking.

COMMENT NO.: 29-A-14
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the generation of K061 wastewaters from air pollution control scrubbers. The Agency recognizes that wastewaters generated as scrubber blowdown from an electric furnace are not listed wastes, however, they may be "derived-from" wastes. Specifically, wastewaters generated from dewatering K061 sludges are K061 wastewaters by the "derived-from" rule. K061 sludges are generated from air pollution control scrubbers when the solids are removed from the blowdown wastewaters. Wastewaters generated from dewatering operations subsequent to the generation of the K061 sludge are K061 wastewaters and are subject to these treatment standards. K061 wastewaters are required to meet these treatment standards prior to any type of land placement, including placement or treatment in surface impoundments.

COMMENT NUMBER: 29-A-15
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA has proposed specific treatment standards for K061 wastewaters based on transferring data from K062 wastewaters that have been treated by chromium reduction followed by lime precipitation and dewatering. Because K061 wastewaters generally have lower concentrations of dissolved metals than K062 wastewaters, EPA believes that K062 wastewaters are more difficult to treat and that therefore it should be technically feasible for K061 wastewaters to meet the proposed standards.

EPA's reasoning is flawed in several significant respects. First, it is often easier to precipitate higher concentrations of dissolved metals than lower concentrations of those metals.. This is because larger particles agglomerate and fall out of solution easier than smaller particles. Thus, waters such as K062 wastewaters with more metals will have more particulates to agglomerate into larger particles. Specifically, the high concentration of agglomerated hydroxide floc particles in K062 wastewaters results in the type of settling known as zone settling. In zone settling, the particles settle as a zone or blanket, and there is a distinct interface between the settling particles and the liquid above the particles. The settling blanket of solids also acts as a filter to entrap smaller suspended particles that otherwise would not settle out of the liquid. In contrast to K062 particles, K061 particles settle as distinct particles with little agglomeration which is referred to as discrete settling. Discrete settling offers no opportunity for entrapment of slowly settling particles as is the case of zone settling. Thus, K062 wastewaters typically will be easier to treat by chemical precipitation than K061 wastewaters.

Second, untreated K062 wastewaters typically contain non-detectable or only trace quantities of lead. See Tables 4-4 through 4-14 in EPA's background document on K061. On the other hand, untreated K061 wastewaters often contain significantly higher concentrations of lead. (See Table Information Claimed as CBI
CBI attached hereto as Exhibit D, and data submitted by Chaparral Steel

Co. attached hereto as Exhibit E). Thus, K061 wastewaters treated by chemical precipitation will have a significantly higher lead level than K062 wastewaters treated by that same process.

Third, K062 wastewaters typically have a low pH and therefore will precipitate when lime, a base and an effective flocculent, is added. K061 wastewaters, on the other hand, typically have a high pH. (CBI
CBI). In fact, K061 leachate derived from monofilled K061 typically has a pH above 12. Id. Consequently, acid addition (rather than lime treatment) will be required to adjust the pH of K061 wastewaters to precipitate metals. There is simply no available data to determine whether metals will become insoluble and settle from K061 wastewaters as effectively as from K062 wastewaters in the absence of a flocculating agent such as lime. In fact, available scientific data indicates that the metals in K061 will not precipitate as effectively as the metals in K062. This is because most metals, and particularly lead, are insoluble within a narrow pH range. Lead hydroxide reaches its

COMMENT NUMBER: 29-A-15 (continued)
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER. SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

minimum solubility of approximately 0.08 mg/l at a pH of 9.2. Changes from this optimum pH will increase the lead concentration significantly. For instance, at a pH of 10 the solubility of lead is 0.3 mg/l and at a pH of 8, the solubility is 10 mg/l. Given the solubility of lead, it is operationally impossible to maintain the pH within the very narrow range that would be necessary to comply with a lead concentration in the range of 0.04 mg/l.

Fourth, the chromium in K062 is primarily hexavalent chromium. Steelmaking, on the other hand, does not produce significant quantities of hexavalent chromium because chromium is reduced by the addition of coke and other feed materials and is easily recovered into the steel. Consequently, EAF dust is exclusively or nearly exclusively in a trivalent state making chromium reduction unnecessary. See Table 9 of the Lehigh Study attached as Exhibit A.

Consequently, we recommend that EPA set characteristic levels as the treatment standards for metals in K061 wastewaters or designate a treatment method for K061 wastewaters of "chemical precipitation and sludge dewatering," rather than numerical treatment levels at least until data on treated K061 wastewaters becomes available.[6]

COMMENT NO.: 29-A-15
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the transfer of treatment performance data from the system treating the K062 composite to K061 wastewaters. All available K061 wastewater treatment data, as well as data for wastes similar to K061, were evaluated for this rulemaking. The Agency wishes to thank the commenter for the inclusion of K061 wastewater characterization data. Specifically, the four data points submitted characterizing K061 wastewaters were used by the Agency for determining the applicability of transferring treatment performance data from other sources of K061 wastewaters. The Agency believes that the K062 data can be used to assess for K061 wastewaters the performance of these technologies (hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate).

EPA compared the two wastewaters (K062 and K061) with regard to characteristics that affect treatment performance and determined that a well-designed and well-operated treatment system should achieve similar or better performance on K061 wastewaters than on K062 wastewaters. The K062 wastewaters that were treated by the system consisting of hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate, were well characterized with respect to parameters affecting treatment performance including concentrations of metals, oil and grease, and organic content of the waste (Envirite Report, 1987). The K062 data show high levels of metals, suspended solids, dissolved solids, and measurable concentrations of oil and grease. Available K061 wastewater characterization data describe a waste stream that can be effectively treated using the above-mentioned treatment technologies to levels equivalent to or below the K062 levels.

COMMENT NO.: 29-A-15 (continued)
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

Specifically, K061 wastewaters typically contain low concentrations of dissolved metals (i.e., less than 100 ppm) while K062 wastewaters generally contain concentrations of dissolved metals (solids) in concentrations greater than 5,000 ppm. Specific metal concentrations were also considered in the comparison, and it was determined that untreated K062 (composite) has higher concentrations than K061: cadmium - 13 mg/l compared to 3.33 mg/l; chromium - 2,581 mg/l compared to 4.3 mg/l; nickel - 16,330 mg/l compared compared to 0.043 mg/l.

Also considered in this comparison were the settling characteristics of the precipitates formed from chemical precipitation. Specifically, the precipitate from the K062 treatment system was primarily a hydroxide while data on K061 indicate that solids will be in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials will not prevent effective treatment by the treatment train for K062 noted above. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The Agency agrees with the commenter that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical

COMMENT NO.: 29-A-15 (continued)
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for precipitation of metals of concern. The Agency agrees with the commenter's assertion that pH control is vital to effective treatment performance. In some cases, several precipitation steps with different pH may be needed to remove different metal constituents with incompatible solubilities.

The evaluation of treatment performance data also addressed the use of hexavalent chromium reduction as a demonstrated treatment technology for K061 wastewaters. The Agency believes that K061 wastewaters may contain treatable concentrations of hexavalent chromium requiring reduction prior to precipitation. As a result, treatment standards for K061 wastewaters are being promulgated for total chromium. The Agency reiterates that any treatment method may be used to meet the treatment standards. In addition, the waste, as generated may not need hexavalent chromium reduction to meet the standards for total chromium.

COMMENT NO.: 29-A-15 (continued)
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The commenter suggest that characteristic levels or a treatment method be set for K061 wastewaters. Whenever possible, the Agency p refers to set a numerical treatment standard rather than specify a treatment method. The Agency can set a method of treatment as BDAT; however, that is usually only done when the constituent of concern cannot be analyzed in the treated residual. In addition, because treatment performance data are available for wastes similar to K061 wastewaters, the Agency can transfer these data. In summary, the Agency is using the K062 data to set treatment standards for cadmium, chromium, and nickel in K061 wastewaters. For lead in K061 wastewaters, treatment performance data are being transferred from D008.

COMMENT NUMBER: 29-A-16
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER. SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA has not proposed to grant a national capacity variance for K061 wastewaters that are surfaced disposed on the grounds that adequate treatment capacity exists. However, the BDAT process for K061 wastewaters of chromium reduction followed by lime precipitation is only effective for and therefore has only been applied to wastewaters with a relatively low pH. It is inappropriate for EPA to transfer performance data or capacity determinations from K062 wastewaters to K061 wastewaters which have a significantly higher pH. See section 6 of these Comments. It will take significant time to develop and make operational a chemical precipitation system that can effectively treat high pH K061 wastewaters. Consequently, EPA should grant a two year national capacity variance for K061 wastewaters with a high pH that either is surface disposed or deep well injected.

COMMENT NO.: 29-A-16
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

In responding to the commenter's technical concerns (capacity determination and responses are included elsewhere in the record) on the effect of pH on the transfer of treatment performance data from K062 to K061 wastewaters, the Agency reiterates that all available wastewater treatment performance data were considered in the rulemaking. In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for hexavalent chromium reduction and precipitation of metals of concern.

COMMENT NUMBER: 29-A-17
DOCKET NUMBER: LD12-00276
COMMENTER: Collier. Shannon & Scott
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA categorizes EAF air pollution scrubber blowdown and wastewaters generated from scrubber sludges as "K061 wastewaters" because they are "derived from" K061. However, as the Agency has recognized in the context of API separator wastewaters, the "derived from" rule is inapplicable to wastewaters generated from the clarification and dewatering of a hazardous waste sludge.

K061 sludge is generated when the solids present in EAF scrubber blowdown water are separated from the water by some method of filtration or sedimentation. The water removed from the sludge is normally returned to the scrubber system or discharged to a treatment system. Treated water is then discharged through an NPDES outfall. The water in this combined waste stream from the air pollution control equipment should not be considered K061. The K061 sludge which is the true waste is not generated until the solids are removed from the wastewater. Therefore, water separated from the combined stream is not "derived-from" waste.

COMMENT NO.: 29-A-17
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's statement that the "derived-from" rule is inapplicable to wastewater generated from air pollution scrubber blowdown. The Agency recognizes that wastewaters generated as scrubber blowdown from an electric furnace are not listed wastes, however, they may be "derived-from" wastes. Specifically, wastewaters generated from dewatering K061 sludges are K061 wastewaters by the "derived-from rule." The commenter is correct in the statement that K061 sludge is not generated until the solids are removed from the blowdown wastewater. Wastewaters generated from dewatering operations subsequent to generation of the K061 sludge are K061 wastewaters and are subject to these treatment standards. K061 wastewaters are required to meet these treatment standards prior to any type of land placement, including placement or treatment in surface impoundments.

COMMENT NUMBER: 29-A-18
DOCKET NUMBER: LD12-00276
COMMENTER: Collier, Shannon & Scott
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

Because wastewaters from EAF scrubber blowdown and sludge dewatering are not "derived from" a hazardous waste, do not exhibit a hazardous characteristic, and are not listed hazardous wastes, they are beyond the scope of this rulemaking.

COMMENT NO.: 29-A-18
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the generation of K061 wastewaters from air pollution control scrubbers. The Agency recognizes that wastewaters generated as scrubber blowdown from an electric furnace are not listed wastes, however, they may be "derived-from" wastes. Specifically, wastewaters generated from dewatering K061 sludges are K061 wastewaters by the "derived-from" rule. K061 sludges are generated from air pollution control scrubbers when the solids are removed from the blowdown wastewaters. Wastewaters generated from dewatering operations subsequent to the generation of the K061 sludge are K061 wastewaters and are subject to these treatment standards. K061 wastewaters are required to meet these treatment standards prior to any type of land placement, including placement or treatment in surface impoundments.

COMMENT NUMBER: 29-A-19
DOCKET NUMBER: LD12-00276
COMMENTER: Collier, Shannon & Scott
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

EPA has proposed specific treatment standards for K061 wastewaters based on transferring data from K062 wastewaters that have been treated by chromium reduction followed by lime precipitation and dewatering. Because K061 wastewaters generally have lower concentrations of dissolved metals than K062 wastewaters, EPA believes that K062 wastewaters are more difficult to treat and that therefore it should be technically feasible for K061 wastewaters to meet the proposed standards.

EPA's reasoning is flawed in several significant respects. First, it is often easier to precipitate higher concentrations of dissolved metals than lower concentrations of those metals. This is because larger particles agglomerate and fall out of solution easier than smaller particles. Thus, waters such as K062 wastewaters with more metals will have more particulates to agglomerate into larger particles. Specifically, the high concentration of agglomerated hydroxide floc particles in K062 wastewaters results in the type of settling known as zone settling. In zone settling, the particles settle as a zone or blanket, and there is a distinct interface between the settling particles and the liquid above the particles. The settling blanket of solids also acts as a filter to entrap smaller suspended particles that otherwise would not settle out of the liquid. In contrast to K062 particles, K061 particles settle as distinct particles with little agglomeration which is referred to as discrete settling. Discrete settling offers no opportunity for entrapment of slowly settling particles as is the case of zone settling. Thus, K062 wastewaters typically will be easier to treat by chemical precipitation than K061 wastewaters.

Second, untreated K062 wastewaters typically contain non-detectable or only trace quantities of lead. See Tables 4-4 through 4-14 in EPA's background document on K061. On the other hand, untreated K061 wastewaters often contain significantly higher concentrations of lead. (See Table Information Claimed as CBI
CBI attached hereto as Exhibit D, and data submitted by Chaparral Steel Co. attached hereto as Exhibit E). Thus, K061 wastewaters treated by chemical precipitation will have a significantly higher lead level than K062 wastewaters treated by that same process.

Third, K062 wastewaters typically have a low pH and therefore will precipitate when lime, a base and an effective flocculent, is added. K061 wastewaters, on the other hand, typically have a high pH. CBI
CBI In fact, K061 leachate derived from monofilled K061 typically has a pH above 12. Id. Consequently, acid addition (rather than lime treatment) will be required to adjust the pH of K061 wastewaters to precipitate metals. There is simply no available data to determine whether metals will become insoluble and settle from K061 wastewaters as effectively as from K062 wastewaters in the absence of a flocculating agent such as lime. In fact, available scientific data indicates that the metals in K061 will

COMMENT NUMBER: 29-A-19 (continued)
DOCKET NUMBER: LD12-00276
COMMENTER: Collier, Shannon & Scott
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
COMMENT:

not precipitate as effectively as the metals in K062. This is because most metals, and particularly lead, are insoluble within a narrow pH range. Lead hydroxide reaches its minimum solubility of approximately 0.08 mg/l at a pH of 9.2. Changes from this optimum pH will increase the lead concentration significantly. For instance, at a pH of 10 the solubility of lead is 0.3 mg/l and at a pH of 8, the solubility is 10 mg/l. Given the solubility of lead, it is operationally impossible to maintain the pH within the very narrow range that would be necessary to comply with a lead concentration in the range of 0.04 mg/l.

Fourth, the chromium in K062 is primarily hexavalent chromium. Steelmaking, on the other hand, does not produce significant quantities of hexavalent chromium because chromium is reduced by the addition of coke and other feed materials and is easily recovered into the steel. Consequently, EAF dust is exclusively or nearly exclusively in a trivalent state making chromium reduction unnecessary. See Table 9 of the Lehigh Study attached as Exhibit A.

Consequently, we recommend that EPA set characteristic levels as the treatment standards for metals in K061 wastewaters or designate a treatment method for K061 wastewaters of "chemical precipitation and sludge dewatering," rather than numerical treatment levels at least until data on treated K061 wastewaters becomes available.

COMMENT NO.: 29-A-19
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The Agency disagrees with the commenter's assessment of the transfer of treatment performance data from the system treating the K062 composite to K061 wastewaters. All available K061 wastewater treatment data, as well as data for wastes similar to K061, were evaluated for this rulemaking. The Agency wishes to thank the commenter for the inclusion of K061 wastewater characterization data. Specifically, the four data points submitted characterizing K061 wastewaters were used by the Agency for determining the applicability of transferring treatment performance data from other sources of K061 wastewaters. The Agency believes that the K062 data can be used to assess for K061 wastewaters the performance of these technologies (hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate).

EPA compared the two wastewaters (K062 and K061) with regard to characteristics that affect treatment performance and determined that a well-designed and well-operated treatment system should achieve similar or better performance on K061 wastewaters than on K062 wastewaters. The K062 wastewaters that were treated by the system consisting of hexavalent chromium reduction, chemical precipitation, and dewatering of the precipitate, were well characterized with respect to parameters affecting treatment performance including concentrations of metals, oil and grease, and organic content of the waste (Envirite Report, 1987). The K062 data show high levels of metals, suspended solids, dissolved solids, and measurable concentrations of oil and grease. Available K061 wastewater characterization data describe a waste stream that can be effectively treated using the above-mentioned treatment technologies to levels equivalent to or below the K062 levels.

Specifically, K061 wastewaters typically contain low concentrations of dissolved metals (i.e., less than 100 ppm) while K062 wastewaters

COMMENT NO.: 29-A-19 (continued)
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

generally contain concentrations of dissolved metals (solids) in concentrations greater than 5,000 ppm. Specific metal concentrations were also considered in the comparison, and it was determined that untreated K062 (composite) has higher concentrations than K061: cadmium - 13 mg/l compared to 3.33 mg/l; chromium - 2,581 mg/l compared to 4.3 mg/l; nickel - 16,330 mg/l compared compared to 0.043 mg/l.

Also considered in this comparison were the settling characteristics of the precipitates formed from chemical precipitation. Specifically, the precipitate from the K062 treatment system was primarily a hydroxide while data on K061 indicate that solids will be in the oxide form. The Agency believes that any differences that may exist in the settling characteristics of these two materials will not prevent effective treatment by the treatment train for K062 noted above. In addition, the addition of flocculating/coagulating agents and the use of filtration may improve treatment of K061 wastewaters.

The Agency agrees with the commenter that other data sources should be evaluated for the transfer of data for lead. The treatment standard for lead was not derived from these K062 data because the K061 wastewaters typically contain higher concentrations of lead than the K062 waste tested. The Agency is transferring treatment performance data from the treatment of D008 wastewater using the system consisting of chemical precipitation, flocculation, clarification, filtration, and sludge thickening, a system essentially identical to and certainly compatible

COMMENT NO.: 29-A-19 (continued)
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

with that used for K062 treatment. The Agency determined that the lead in the D008 waste is more difficult to treat than the lead concentrations in K061 wastewater and is using these data to promulgate treatment standards for lead in K061 wastewaters.

In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for precipitation of metals of concern.

The Agency agrees with the commenter's assertion that pH control is vital to effective treatment performance. In some cases, several precipitation steps with different pH may be needed to remove different metal constituents with incompatible solubilities.

The evaluation of treatment performance data also addressed the use of hexavalent chromium reduction as a demonstrated treatment technology for K061 wastewaters. The Agency believes that K061 wastewaters may contain treatable concentrations of hexavalent chromium requiring reduction prior to precipitation. As a result, treatment standards for K061 wastewaters are being promulgated for total chromium. The Agency reiterates that any treatment method may be used to meet the treatment standards. In addition, the waste, as generated may not need hexavalent chromium reduction to meet the standards for total chromium.

COMMENT NO.: 29-A-19 (continued)
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

The commenter suggest that characteristic levels or a treatment method be set for K061 wastewaters. Whenever possible, the Agency p refers to set a numerical treatment standard rather than specify a treatment method. The Agency can set a method of treatment as BDAT; however, that is usually only done when the constituent of concern cannot be analyzed in the treated residual. In addition, because treatment performance data are available for wastes similar to K061 wastewaters, the Agency can transfer these data. In summary, the Agency is using the K062 data to set treatment standards for cadmium, chromium, and nickel in K061 wastewaters. For lead in K061 wastewaters, treatment performance data are being transferred from D008.

COMMENT NUMBER: 29-A-20

DOCKET NUMBER: LD12-00276

COMMENTER: Collier, Shannon & Scott

ISSUE: K061

SUBISSUE: Wastewater Treatment Standards

COMMENT:

EPA has not proposed to grant a national capacity variance for K061 wastewaters that are surfaced disposed on the grounds that adequate treatment capacity exists. However, the BDAT process for K061 wastewaters of chromium reduction followed by lime precipitation is only effective for and therefore has only been applied to wastewaters with a relatively low pH. It is inappropriate for EPA to transfer performance data or capacity determinations from K062 wastewaters to K061 wastewaters which have a significantly higher pH. See section 6 of these Comments. It will take significant time to develop and make operational a chemical precipitation system that can effectively treat high pH K061 wastewaters. Consequently, EPA should grant a two year national capacity variance for K061 wastewaters with a high pH that either is surface disposed or deep well injected.

COMMENT NO.: 29-A-20
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON AND SCOTT
ISSUE: K061
SUBISSUE: Wastewater Treatment Standards
RESPONSE:

In responding to the commenter's technical concerns (capacity determination and responses are included elsewhere in the record) on the effect of pH on the transfer of treatment performance data from K062 to K061 wastewaters, the Agency reiterates that all available wastewater treatment performance data were considered in the rulemaking. In the evaluation of the transfer of data from K062 to K061, the Agency considered the pH of the wastewaters. The Agency believes that pH is a parameter that can be readily altered in the treatment system through the addition of precipitation and other reagents. Other chemicals (or wastes) can be added to wastewaters prior to or during the treatment process to result in the optimum pH for hexavalent chromium reduction and precipitation of metals of concern.

COMMENT NUMBER: 29-B-1
DOCKET NUMBER: LD12-00088
COMMENTER: INCO UNITED STATES, INC., INCO LTD., AND
THE INTERNATIONAL METALS RECLAMATION COMPANY, INC.
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

Although the foregoing observation was made with respect to the treatment standard for high zinc K061, it applies with equal force to low zinc K061, as long as the low zinc K061 contains recoverable levels of nickel and/or chromium, making it suitable as a feedstock for a secondary nickel-chromium smelting process. INMETCO conducts just such a process at its facility in Ellwood City, Pennsylvania.10/ EPA should, therefore, revise the K061 treatment standards to specify resmelting in a high temperature metals recovery furnace as the method of treatment for any K061 waste that contains recoverable metal values, whether the metal happens to be zinc, nickel, or chromium. This would represent a consistent and environmentally beneficial approach to regulating K061 under the land disposal restriction program and would give effect to EPA's recognition that recycling/recovery generally is "the best method for treating a waste . . . ."11/

COMMENT NO.: 29-B-1
DOCKET NUMBER: LD12-00088
COMMENTER: INCO UNITED STATES, INC., INCO LTD., AND THE INTERNATIONAL METALS RECLAMATION COMPANY, INC.
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The commenter addresses the use of high temperature metals recovery for nonwastewater forms of K061, including both the low and high zinc subcategories. The Agency is aware that high temperature metals recovery technologies are applicable to recovering other metals in addition to zinc. The use of such technologies for recovery of metals in addition to zinc in K061 wastes is consistent with the Agency's (and RCRA's) intention to encourage resource recovery and to minimize land disposal. In addition, for low zinc K061, any technology including high temperature metals recovery can be used to meet the treatment standards for cadmium, chromium, lead, and nickel in the treated residual.

COMMENT NUMBER: 29-B-2
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

Olin concurs with the USEPA in that "where USEPA specifies a method of treatment under section 3004(m), residues from that treatment process may be land disposed without further treatment." Olin requests that this statement be placed in the General Applicability section in the final rule preamble.

The USEPA seems to contradict itself in this same section where it states that metal recovery residues must not be a characteristic waste otherwise "... they would have to meet the treatment standard for that characteristic." We believe not only is this statement in conflict with the general "once treated no longer land disposed restricted" standard, but in some cases may be impractical. As was pointed out by the Chlorine Institute in its comments on BDAT, mercury retorting of K106 and U151 wastes may not be as efficient as the USEPA believes. If a hazardous waste stream has 15,000 ppm total mercury before retorting and it is necessary to reduce the total mercury to 4 ppm in order to achieve a 200 ppb extract (the characteristic level for mercury), a metals recovery of 99.98% would be required. It is extremely questionable whether or not any retort or recovery system can be this efficient. Olin request that USEPA retract that statement that "metals recovery process... have to meet the treatment standard for that characteristic" in order to be land disposed.

COMMENT NO.: 29-B-2
DOCKET NUMBER: LD12-00129
COMMENTER: OLIN CHEMICALS
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency agrees with the commenter that residues from high temperature metals recovery may be land disposed without further treatment. In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to be "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The Agency, however, reiterates that to ensure that the metals recovery process performs efficiently, that any residues that exhibit a characteristic level (measured by the TCLP), must be treated to levels below the characteristic level.

COMMENT NUMBER: 29-B-3
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT, INC., AND CHEMICAL WASTE MANAGEMENT, INC.
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

HTMR facilities generate residuals from the recovery process that must be discarded. EPA states to "assure that the metals recovery process performs efficiently . . . any residues must not exhibit any of the characteristics of hazardous waste." 54 Fed. Reg. at 48,457. We do not believe the characteristic levels represent BDAT for HTMR.

Lead and zinc found in EAF dust tend to volatize under similar temperature and pressure conditions. If the resmelting technology is effective in recovering a high percentage of zinc it will also recover a similarly high percentage of lead, sharply reducing its constituent concentration.

In addition, the mobility and toxicity of metals in the residues may be further reduced by resmelting technologies through the addition of reagents to the smelting furnace feed stock. Inexpensive reagents have been shown to be effective for this purpose.

In summary, efficient resmelting technologies can recover a high percentage of lead (+90%) present in K061,[6] and through the addition of inexpensive reagents to the material feed, the metals remaining in the residuals can be effectively immobilized. As a result, no reason exists to simply set the characteristic levels as the treatment target. Even less reason exists to set the characteristic levels in the HTMR residue higher than the treatment standards for stabilized K061. More stringent control of process residue is both reasonable and attainable

COMMENT NO.: 29-B-3
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT, INC., AND CHEMICAL WASTE MANAGEMENT, INC.
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency disagrees with the commenter's point that "HTMR facilities generate residuals from the recovery process that must be discarded." In some cases, several recoverable products can result from these technologies and no treatment residuals are generated requiring land disposal. The Agency is aware, however, that in many instances the technology generates residues that may require land disposal.

In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The residues from high temperature metals recovery are no longer K061, and can be land disposed without further treatment unless they exhibit a hazardous characteristic. If such a residue is hazardous (measured by the TCLP), then it must be treated to levels lower than the characteristic level. In addition, available data indicate that well designed and well operated treatment systems generate residues well below the characteristic level. These data indicate that metal mobilities (measured by the TCLP) in these residues are typically similar to or lower than those achieved by stabilization.

COMMENT NUMBER: 29-B-4
DOCKET NUMBER: LD12-00160
COMMENTER: AMERICAN IRON AND STEEL INSTITUTE
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

AISI maintains that materials used as feedstock in an industrial production process (*e.g.*, K061 inserted into a zinc recovery furnace) are not "discarded" and therefore are not "solid wastes" under RCRA. American Mining Congress v. EPA, 824 F.2d 1177 (D.C. Cir. 1987). Furthermore, material recovery in industrial production processes (*e.g.*, Resmelting in a High Temperature Zinc Metal Recovery Furnace") is not "treatment" under the RCRA statutory definition. *See* Brief of American Mining Congress, Shell Oil v. EPA, No. 80-1532 and consolidated cases (D.C. Cir.) (filed September 5, 1989). Accordingly, zinc recovery of K061 is not subject to RCRA regulation, whether or not the recovered materials are indigenous under EPA's proposed definition. *See* 54 Fed. Reg. 43718 (October 26, 1989). However, for purposes of the following comments, AISI will assume this material may be treated as a hazardous waste.

COMMENT NO.: 29-B-4
DOCKET NUMBER: LD12-00160
COMMENTER: AMERICAN IRON AND STEEL INSTITUTE
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency disagrees with the commenter with respect to treatment standards for K061 nonwastewaters. In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The treatment residuals from high temperature metals recovery are not hazardous wastes unless they exhibit a hazardous characteristic. If such a residue is hazardous by characteristic (measured by the TCLP), then it must be treated to levels lower than the characteristic level.

COMMENT NUMBER: 27-B-5

DOCKET NUMBER: LD12-00160

COMMENTER: AMERICAN IRON AND STEEL INSTITUTE

ISSUE: K061

SUBISSUE: High Temperature Metals Recovery and Residuals

COMMENT:

AISI strongly recommends, therefore, that if this regulatory change is made, the regulations should clarify that the residues from this process are not "derived from" hazardous wastes, and are regulated under RCRA Subtitle C only if they exhibit one of the characteristics of hazardous waste. AISI believes that this is the EPA's intention in proposing to promulgate this rule but urges that it be clarified in final rulemaking.

COMMENT NO.: 29-B-5
DOCKET NUMBER: LD12-00160
COMMENTER: AMERICAN IRON AND STEEL INSTITUTE
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The Agency agrees with commenter that the residues from high temperature metals recovery are not K061 wastes and are not hazardous wastes unless they exhibit a hazardous characteristic (measured by the TCLP). If such a residue is a hazardous waste by characteristic, then it must be treated to levels below the characteristic level.

COMMENT NUMBER: 27-B-6
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

EPA has proposed to revise the treatment standard for the high zinc subcategory for K061 nonwastewaters from "No Land Disposal" to "resmelting in a High Temperature Zinc Metal Recovery Furnace." In the First-Third rule, EPA clearly explained that it was promulgating this purported "method" of BDAT, rather than the preferred approach of setting concentration-based treatment standards, solely because EPA believed it did not have RCRA jurisdiction over the waste residue from a recovery furnace that burned K061 EAF dust due to the "indigenous principle". Thus EPA did not make a reasoned technical judgment that a method, rather than levels, of treatment was best. EPA resorted to specifying a method solely because it believes it has no jurisdiction once the K061 waste enters the furnace, and thus no ability to impose concentration-based standards as measured in the treatment residue.

EPA's position is erroneous as a matter of law. RCRA clearly does provide jurisdiction over hazardous wastes that are reclaimed, such as in a zinc recovery furnace. The so-called "indigenous principle" is a sham – it is merely an excuse for exempting smelters from the land disposal requirements and RCRA regulations in toto simply to facilitate recovery of zinc, while other toxic metal contaminants in K061 are dumped indiscriminantly via the slag. EPA's latest effort to shore up its position is equally transparent. The proposed revision to the purported BDAT standard for high-zinc K061 does not reflect a reasoned decision based on the record that promulgating a method, rather than treatment levels, is preferable for sound technical reasons. EPA's proposed action continues to be based on an erroneous legal conclusion that

COMMENT NUMBER: 29-B-6 (continued)
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

RCRA jurisdiction over an avowedly hazardous EAF emission control dust (lead, cadmium, chromium, etc.) somehow stops the moment the waste is shoveled into a zinc smelter's furnace. There was no legitimate legal or record is no basis here. The "indigenous principle" is unlawful, and is not even a promulgated rule, yet it is being applied here to justify a final regulatory action. This violates the APA.

EPA explains in the proposed rule that high temperature metals recovery is BDAT based on data showing that metals mobility in slag is comparable to stabilized waste, but this discussion misses the point. For any technology that is BDAT, EPA has already set forth in the Framework Rule that the Agency will establish concentration-based treatment standards rather than specify a technology whenever possible. EPA has provided no justification for departing from the Framework Rule. EPA compounds its lack of adequate justification by then declaring that the residue can be "land disposed without further treatment", without disclosing that this means dumped on the ground in unlined units that do not meet minimum technology requirements. EPA has failed to fully disclose for public comment the consequences of its erroneous position. Certainly stabilized K061 dust must be disposed of in min tech units. Even if the cadmium, lead, and chromium in EAF dust are similarly rendered less mobil after high temperature metals recovery, this provides no legal or technical justification for exempting the waste residue from RCRA 3004(m) and (o) requirements. Nor has EPA justified the illegal action of cutting off the plain application of the derived-from rule which makes the residue from treatment/recovery of EAF dust a hazardous waste. EPA's action is patently unlawful.

COMMENT NO.: 29-B-6
DOCKET NUMBER: LD12-00172
COMMENTER: HAZARDOUS WASTE TREATMENT COUNCIL
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters.

The Agency disagrees with the commenter's discussion relative to evaluating the effectiveness of high temperature metals recovery compared to stabilization. The available data indicate that treatment residues have metals mobilities similar to or lower than the stabilized waste. In addition, the use of high temperate metals recovery reduces the volume of waste to be land disposed, especially compared with stabilized wastes. The effective application and operation of the technology is also considered in the rulemaking, and are reflected in the Agency's reiteration that any residues must not exhibit any of the characteristics of a hazardous waste. If the residues do exhibit a characteristic level (measured by the TCLP), then the residuals must be treated to levels lower than the characteristic level.

COMMENT NUMBER: 29-B-7
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

EPA has proposed to revise the promulgated treatment standard for high zinc K061 nonwastewaters from "No Land Disposal" to "Resmelting in a High Temperature Zinc Metal Recovery Furnace." EPA based the promulgated "no land disposal" standard on the assumption that EPA's proposed indigenous waste rule, when final, would exempt from regulation slag generated by high temperature metals recovery. 53 Fed. Reg. 31138, 31162 (Aug. 17, 1988). Thus, the standard of "no land disposal" was intended to require high zinc K061 to be treated by the BDAT process of high temperature metals recovery (HTMR). It is not clear, however, whether the recently proposed definition of the indigenous waste principle would exempt all industrial furnaces that reclaim metals from K061.

Consequently, we generally support EPA's proposal to define the land disposal standard for high zinc K061 to more accurately reflect the Agency's intention that it be treated by high temperature metal reclamation. The only problem with EPA's proposed standard is that it fails to recognize the viability of processes that reclaim metals from K061 other than zinc. For example, lead and cadmium can also be reclaimed from high zinc K061.[1] See 54 Fed. Reg. 43718, 43732, fn. 19 (Oct. 26, 1989). If lead or cadmium were reclaimed from K061 in a high temperature metals furnace (prior to zinc reclamation), then slag generated could not be land disposed under the proposed treatment standard even though the K061 was being treated by the BDAT process of HTMR. Consequently, we recommend that EPA broaden the final treatment standard for high zinc K061 to include lead and cadmium as well as zinc recovery by high temperature metals recovery. Notably, this is the approach taken by EPA in setting a treatment method for D008 (High Lead) wastes identified as "Thermal Recovery."

COMMENT NO.: 29-B-7
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency agrees with the commenter that high temperature metals recovery processes are applicable to recovering metals in addition to zinc. The use of such technologies for recovery of metals in addition to zinc in K061 wastes is consistent with the Agency's (and RCRA's) intention to encourage resource recovery and to minimize land disposal. The Agency is aware that several facilities recover lead, cadmium, nickel, chromium, and iron, in addition to zinc. These technologies typically recover several metals simultaneously as volatile products. There are some technologies, however, that facilitate recovery of metal products through several processing steps, in series, using different temperatures to volatize different metals. In cases where this may occur, the "non-volatile" residue from the earlier step (recovery of metal more volatile than zinc) will be subsequently processed to recover zinc and will not be discarded as a residue.

In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The Agency wishes to clearly state that this standard does not preclude the recovery of other metals that may be present in the waste. In fact, the use of such technologies for recovery of metals other than zinc is consistent with the Agency's (and RCRA's) intention to encourage resource recovery and to minimize land disposal.

COMMENT NUMBER: 29-B-8
DOCKET NUMBER: LD12-00276
COMMENTER: Collier, Shannon & Scott
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
COMMENT:

EPA has proposed to revise the promulgated treatment standard for high zinc K061 nonwastewaters from "No Land Disposal" to "Resmelting in a High Temperature Zinc Metal Recovery Furnace." EPA based the promulgated "no land disposal" standard on the assumption that EPA's proposed indigenous waste rule, when final, would exempt from regulation slag generated by high temperature metals recovery. 53 Fed. Reg. 31138, 31162 (Aug. 17, 1988). Thus, the standard of "no land disposal" was intended to require high zinc K061 to be treated by the BDAT process of high temperature metals recovery (HTMR). It is not clear, however, whether the recently proposed definition of the indigenous waste principle would exempt all industrial furnaces that reclaim metals from K061.

Consequently, we generally support EPA's proposal to define the land disposal standard for high zinc K061 to more accurately reflect the Agency's intention that it be treated by high temperature metal reclamation. The only problem with EPA's proposed standard is that it fails to recognize the viability of processes that reclaim metals from K061 other than zinc. For example, lead and cadmium can also be reclaimed from high zinc K061." See 54 Fed. Reg. 43718, 43732, fn. 19 (Oct. 26, 1989). If lead or cadmium were reclaimed from K061 in a high temperature metals furnace (prior to zinc reclamation), then slag generated could not be land disposed under the proposed treatment standard even though the K061 was being treated by the BDAT process of HTMR. Consequently, we recommend that EPA broaden the final treatment standard for high zinc K061 to include lead and cadmium as well as zinc recovery by high temperature metals recovery. Notably, this is the approach taken by EPA in setting a treatment method for D008 (High Lead) wastes identified as "Thermal Recovery."

COMMENT NO.: 29-B-8
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency agrees with the commenter that high temperature metals recovery processes are applicable to recovering metals in addition to zinc. The use of such technologies for recovery of metals in addition to zinc in K061 wastes is consistent with the Agency's (and RCRA's) intention to encourage resource recovery and to minimize land disposal. The Agency is aware that several facilities recover lead, cadmium, nickel, chromium, and iron, in addition to zinc. These technologies typically recover several metals simultaneously as volatile products. There are some technologies, however, that facilitate recovery of metal products through several processing steps, in series, using different temperatures to volatize different metals. In cases where this may occur, the "non-volatile" residue from the earlier step (recovery of metal more volatile than zinc) will be subsequently processed to recover zinc and will not be discarded as a residue.

In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. The Agency wishes to clearly state that this standard does not preclude the recovery of other metals that may be present in the waste. In fact, the use of such technologies for recovery of metals other than zinc is consistent with the Agency's (and RCRA's) intention to encourage resource recovery and to minimize land disposal.

COMMENT NUMBER: 29-B-9

DOCKET NUMBER: LD12-00137

COMMENTER: USPCI, INC.

ISSUE: K061

SUBISSUE: High Temperature Metals Recovery and Residues

COMMENT:

Several places in the proposed rule EPA states that recycling should be given a quantitative advantage over treatment and disposal methods. The discussion on K061 is one example of this preference. USPCI vigorously objects to this quantitative preference for recycling.

EPA should give recycling an advantage only if it produces equivalent environmental protection. All other things being equal EPA should select the recycling method over the treatment and disposal method.

Rarely, are all things equal. High temperature metals recovery (HTMR) is selected as the BDAT for high zinc K061. EPA believes that residues from HTWR need not meet the numerical BDAT requirements, rather they should only meet the characteristic standard (i.e. EP Toxic). USPCI notes that a large recycling facility of K061 is also one of the largest uncontrolled waste sites in the country with an enormous pile of residue leaching lead into the groundwater. This type of uncontrolled waste management activity simply should not be given a preference over environmentally sound stabilization and subtitle C landfill disposal.

USPCI believes that the residues from recycling the waste should also meet equivalent levels of environmental protection in order for the LDR program to obtain its full promise of protecting the environmental form harmful release of hazardous constituents. USPCI recommends that EPA permanently extend the option for stabilization of K061 wastes.

COMMENT NO.: 29-B-9
DOCKET NUMBER: LD12-00137
COMMENTER: USPCI, Inc.
ISSUE: K061
SUBISSUE: High Temperature Metals Recovery and Residuals
RESPONSE:

The Agency disagrees with the commenter on the priority given to recovery technologies over treatment and disposal methods. RCRA clearly states that recovery techniques for hazardous wastes are preferred over treatment or disposal methods because they reduce reliance on land disposal. In addition, the use of recovery technologies such as high temperature metals recovery is preferred because it fulfills RCRA's statutory objective of recycling and waste minimization while achieving significant reductions in metals mobility. In fact, available data indicate that metal mobilities in residues from high temperature metals recovery are similar to or lower than those achieved by stabilization. The residues from high temperature metals recovery processes are also subject to land disposal restrictions. To assure that the metals recovery process performs efficiently, any residues that exhibit a characteristic level (measured by the TCLP), must be treated to levels below the characteristic level.

The Agency views high temperature metals recovery as superior to stabilization for several reasons (described above) and therefore is the basis for the treatment standard for the high zinc subcategory of K061 nonwastewaters. In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters. In addition, the Agency is extending the existing, interim treatment standards based on stabilization for another year because of a shortage in high temperature metals recovery capacity.

COMMENT NUMBER: 29-C-1
DOCKET NUMBER: LD12-00003
COMMENTER: RECONTEX
ISSUE: K061
SUBISSUE: Treatment Technologies for Nonwastewaters
COMMENT:

RECONTEK objects to a standard resmelting high temperature zinc metal recovery furnace as the method treatment for K061. While we agree that [redacted] materials can be recycled, we believe that the use of resmelting as a single technology is too limiting. RECONTEK has, along with other companies, demonstrated that hydrometallurgical technologies for the leaching of zinc, cadmium, and lead from K061 and their subsequent recovering and recycling is a valid and viable technology. Therefore, we would recommend that the BADT standard for K061 be either resmelting at high temperature zinc metal recovery furnace or alternative hydrometallurgical technologies that can achieve the same yield standards.

COMMENT NO.: 29-C-1
DOCKET NUMBER: LD12-00003
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Treatment Technologies for Nonwastewaters
RESPONSE:

The Agency evaluated numerous treatment technologies for nonwastewater forms of K061 as part of the First Third rule. A major portion of this effort involved the identification of applicable and demonstrated treatment technologies for K061 nonwastewaters. Hydrometallurgical technologies were identified as being applicable to K061 wastes, however, no data were available showing that these methods were demonstrated on K061 or similar wastes. The commenter claims that these methods are demonstrated, however, no full-scale commercial treatment data were submitted. The Agency cannot evaluate adequately these technologies without treatment performance data. Based on the evaluation and field demonstration of the technology, the Agency is using high temperature metals recovery as the basis for the treatment standards for the high zinc subcategory of K061 nonwastewaters. In the Third Third proposed rule, the Agency proposed to revise the description of the treatment standard for the high zinc subcategory of K061 nonwastewaters to "resmelting in a high temperature zinc metal recovery furnace." The Agency, however, chose not to amend the standard and "no land disposal based on high temperature metals recovery as a method of treatment" remains the treatment standard for high zinc K061 nonwastewaters.

For the low zinc subcategory, any treatment technology can be used (including hydrometallurgical techniques) to meet the treatment standards for cadmium, chromium, lead, and nickel in the treated residual.

COMMENT NUMBER: 29-C-2

DOCKET NUMBER: LD12-00275

COMMENTER: COLLIER. SHANNON & SCOTT

ISSUE: K061

SUBISSUE: Treatment Technologies for Nonwastewaters

COMMENT: EPA has proposed treatment standards for D008 nonwastewaters in the High Lead Subcategory expressed as "Thermal Recovery" and for D008 nonwastewaters in the Low Lead Subcategory expressed as 0.51 mg/l (TCLP) of lead based on stabilization data on F006. EPA has proposed "resmelting in a high temperature zinc metal recovery furnace" as the treatment standard for High Zinc K061 nonwastewaters.

As EPA recognizes in Table III.B.I.(c) of the preamble, there is still inadequate capacity available for thermal recovery of metals. Consequently, EPA has proposed to extend the variance for the thermal metals recovery for K061 (High Zinc) nonwastewaters.

In order to promote the effective recycling of bag house dusts until metals recovery capacity becomes available and to ensure adequate competition with multiple treatment processes in the future, EPA should establish "insolubilization" or "vitrification", as an alternative method of treatment for D008 (lead) nonwastewaters and for K061 nonwastewaters. Insolubilization involves melting hazardous ingredients in bag house dusts with glass to create a product incapable of being dissolved in a liquid. Potters Industries Inc. and Roth Brothers Smelting Corporation have developed as co-patentors an effective insolubilization process to treat emission control dusts from aluminum smelters (which often exhibit EP Toxicity for lead) and specialty steel smelters (electric arc furnace dust or K061). As part of the treatment process, Potters will sell milled soda lime glass, in bulk form, to aluminum and specialty steel smelters as a pre-coating for bag houses. The smelting operations will introduce the product into the air stream of a bag house in order to put a layer of glass powder on the bag. The shaken down dust from the bag house, which will include the glass powder and the hazardous dust, will then be ready for treatment either at the same facility or it will be prepared for transportation to the site where treatment will take place.

The treatment itself takes place in an enclosed chamber where additional molten glass is maintained in a lower horizontal chamber. The glass/dust mixture is heated to a sufficiently high temperature to cause the bag house waste material to break down into ash and gaseous components. Ashes and any noncombustible materials, such as metal oxides, drop and are melted into the glass. Gases from the process are passed through filters which catch any stray particulates. The filter is then loaded into the process, burned in the furnace where it dissolves and is captured in the glass. Ultimately, the molten glass is fritted and after cooling it is ready to be sold for use in making glass products. These products have special properties of hardness and toughness for use as a non-skid abrasive, as a roofing granule, as a ceramic flux, as a material from which acid-resistant bricks can be manufactured, and as a particle for the manufacture of inexpensive coated or loose grain industrial abrasives, and as a raw material for industrial glass beads.

The glass product can also be used as aggregate in bituminous concrete. Potters is concerned that using its glass product as road fill or as concrete aggregate could be considered land disposal of a hazardous waste. The proposed regulations would prohibit such effective recycling by mandating treatment of bag house dusts by thermal treatment. Consequently, Potters requests that its insolubilization process be considered as an alternative treatment method for D008 and K061 manufacturers.

COMMENT NO.: 29-C-2
DOCKET NUMBER: LD12-00275
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Treatment Technologies for Nonwastewaters
RESPONSE:

The commenter has accurately identified that a shortage exists in capacity for high temperature zinc metal recovery for K061 wastes. The Agency, therefore, is extending the existing, interim treatment standard for the high zinc subcategory based on the performance of stabilization. These standards include levels for cadmium, chromium, lead, and nickel in the treated residuals. For the high zinc subcategory during the one-year effective period for these interim standards, any treatment technology (including insolubilization or vitrification) can be used to meet the standards. In addition, for the low zinc subcategory of K061 nonwastewaters, any treatment technology can be used to meet these same treatment standards. The treated residues from these processes (insolubilizaton or vitrification) are K061 wastes and subject to the treatment standards for cadmium, chromium, lead, and nickel, prior to land disposal.

COMMENT NUMBER: 29-D-1
DOCKET NUMBER: LD12-00081
COMMENTER: ENVIROSAFE MANAGEMENT SERVICES. INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

EPA has proposed a clarification of high temperature zinc metal recovery furnace technology for K061 material. We support that proposed treatment technology. I fact, in dealing with one of our specific large clients, TAMCO in Etiwanda, California, it is apparent that the industry is serious about providing this type of technology. Our client has signed contracts for the construction and operation of the appropriate technology but will need additional time to get the technology in place.

COMMENT NO.: 29-D-1
DOCKET NUMBER: LD12-00081
COMMENTER: ENVIROSAFE MANAGEMENT SERVICES INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 29-D-2

DOCKET NUMBER: LD12-00137

COMMENTER: USPCI. INC.

ISSUE: K061

SUBISSUE: Availability of High Temperature Metals Recovery

COMMENT:

Several places in the proposed rule EPA states that recycling should be given a quantitative advantage over treatment and disposal methods. The discussion on K061 is one example of this preference. USPCI vigorously objects to this quantitative preference for recycling.

EPA should give recycling an advantage only if it produces equivalent environmental protection. All other things being equal EPA should select the recycling method over the treatment and disposal method.

Rarely, are all things equal. High temperature metals recovery (HTMR) is selected as the BDAT for high zinc K061. EPA believes that residues from HTWR need not meet the numerical BDAT requirements, rather they should only meet the characteristic standard (i.e. EP Toxic). USPCI notes that a large recycling facility of K061 is also one of the largest uncontrolled waste sites in the country with an enormous pile of residue leaching lead into the groundwater. This type of uncontrolled waste management activity simply should not be given a preference over environmentally sound stabilization and subtitle C landfill disposal.

USPCI believes that the residues from recycling the waste should also meet equivalent levels of environmental protection in order for the LDR program to obtain its full promise of protecting the environmental form harmful release of hazardous constituents. USPCI recommends that EPA permanently extend the option for stabilization of K061 wastes.

COMMENT NO.: 29-D-2
DOCKET NUMBER: LD12-L0042
COMMENTER: INTERNATIONAL MILL SERVICE INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 29-D-3
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT, INC., AND CHEMICAL WASTE MANAGEMENT, INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

EPA solicits comments on whether to extend the duration of the existing, interim treatment standard for K061, which is based on the performance of stabilization technology. 54 Fed. Reg. at 48,457. It notes that available information suggests insufficient high temperature metals recovery (HTMR) capacity exists to handle the demand for the high zinc subcategory of K061. Rather than be confronted by a host of petitions for case-by-case extensions, EPA asks for information concerning efforts that have been made to construct and operate HTMR facilities and arrangements that are being made to enter into contracts to use this technology.

WMI is pleased EPA has taken this approach to resolving the current shortfall in HTMR capacity. As EPA knows, the permitting and construction of a new hazardous waste treatment facility is expensive and time consuming. HTMR facilities present a unique problem in this regard because the category of wastes they can handle is limited.

Following three years of extensive discussions with producers of K061, WMI has completed a proposal to own and operate a high temperature metal recovery facility in the Jackson, Mississippi area. As projected, the facility will have

COMMENT NUMBER: 29-D-3(continued)
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT. INC., AND CHEMICAL WASTE MANAGEMENT. INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

the capacity to manage up to 100,000 tons of K061 per year. The actual capacity of the facility, and in fact its construction, depend, however, upon WMI's obtaining binding contractual commitments from generators to use the facility once it is operating.

WMI presented a proposal and service contract to a large group of generators in December 1989 seeking commitments to use the facility. The company has concluded that it must have commitments totalling 40,000 tons of K061 per year to commence construction. If EPA does not extend the interim standard, all generators making such a contractual commitment will be forced to seek case-by-case extensions instead.

The proposed facility will require a RCRA Part B storage permit, as well as permits for air and water discharges. Assuming sufficient commitments from generators are obtained, our schedule for permitting and constructing the facility is from fifteen to eighteen months.

We are too early in the solicitation process to provide firm information concerning when, or even whether, the facility will be available. Early reactions from generators have been generally favorable. As the expiration date for the interim standard (August 8, 1990)) nears, we believe the need for a

COMMENT NUMBER: 29-D-3 (continued)
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT, INC., AND CHEMICAL WASTE MANAGEMENT, INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

nationwide extension of the interim standard will become even more clear.

We urge the Agency to act now on its broad solution to the current HTMR capacity shortfall, rather than leave generators no other option but to seek case-by-case extensions. We would be happy to provide the Agency more information about the proposed Jackson facility as it becomes available.

COMMENT NO.: 29-D-3
DOCKET NUMBER: LD12-00159
COMMENTER: WASTE MANAGEMENT, INC., AND CHEMICAL WASTE MANAGEMENT, INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 29-D-4
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

EPA solicits comments on the advisability of extending the duration of the existing, interim treatment standards (based on stabilization technology) for another year because available information suggests that there is still insufficient high temperature metals recovery (HTMR) capacity. EPA correctly recognizes that in light of this inadequate capacity, it would be far more cost-effective and efficient for the Agency to grant an across-the-board variance rather than process hundreds of individual case-by-case variances.

Our findings support EPA's conclusion. Individual SMA member companies are still having tremendous difficulty in locating facilities that have available capacity to reclaim metals from their K061. In response to this shortage of capacity to treat K061 by HTMR, some steel companies are looking to develop HTMR processes on site. These companies' good faith efforts to meet the upcoming HTMR treatment standards have been thwarted, however, by the cloud of uncertainty over the future regulation of K061 land disposal. Specifically, steel companies are reluctant to spend millions of dollars on HTMR furnaces and then be unable to land dispose slag generated from these furnaces because it falls outside the scope of EPA's final indigenous waste rule. Consequently, EPA should extend the variance for the high zinc K061 treatment standards so that the treatment industry and the steel industry can develop sufficient HTMR capacity by constructing and operating furnaces that respond to and comply with the major regulatory changes pertaining to K061 land disposal that currently are taking place.

COMMENT NO.: 29-D-4
DOCKET NUMBER: LD12-00274
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 29-D-5
DOCKET NUMBER: LD12-00276
COMMENTER: Collier. Shannon & Scott
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

EPA solicits comments on the advisability of extending the duration of the existing, interim treatment standards (based on stabilization technology) for another year because available information suggests that there is still insufficient high temperature metals recovery (HTMR) capacity. EPA correctly recognizes that in light of this inadequate capacity, it would be far more cost-effective and efficient for the Agency to grant an across-the-board variance rather than process hundreds of individual case-by-case variances.

Our findings support EPA's conclusion. Many steel companies are still having tremendous difficulty in locating facilities that have available capacity to reclaim metals from their K061. In response to this shortage of capacity to treat K061 by HTMR, some steel companies are looking to develop HTMR processes on site. These companies' good faith efforts to meet the upcoming HTMR treatment standards have been thwarted, however, by the cloud of uncertainty over the future regulation of K061 land disposal. Specifically, steel companies are reluctant to spend millions of dollars on HTMR furnaces and then be unable to land dispose slag generated from these furnaces because it falls outside the scope of EPA's final indigenous waste rule. Consequently, EPA should extend the variance for the high zinc K061 treatment standards so that the treatment industry and the steel industry can develop sufficient HTMR capacity by constructing and operating furnaces that respond to and comply with the major regulatory changes pertaining to K061 land disposal that currently are taking place.

COMMENT NO.: 29-D-5
DOCKET NUMBER: LD12-00276
COMMENTER: COLLIER, SHANNON & SCOTT
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 29-D-6
DOCKET NUMBER: LD12-L0042
COMMENTER: INTERNATIONAL MILL SERVICE INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
COMMENT:

IMS' Resource Recovery Division is in the start-up phase of two commercial facilities which utilize plasma technology to process K061.

IMS currently designs the process to be physically attached via a closed conveyance system to the client mill's dust collection system. Because of this, our program is usually site specific to a single client steel mill.

Once a client mill signs a long-term contract with IMS, approximately ten months is required before a facility is built and operable. For this reason, and because IMS is still in the start-up phase, IMS cannot physically build facilities fast enough to enable the electric furnace steel producers to comply with the August 8, 1990 land ban on K061.

To our knowledge, we are the only supplier that has a start-up facility onsite at a steel mill. It is our further understanding that the K061 thermal treatment industry does not have sufficient capacity to treat all high zinc K061 currently produced by the United States steel mills. Accordingly, we support the EPA's November 22, 1989 proposal to extend for one year the August 8, 1990 high zinc land ban which is currently in effect.

COMMENT NO.: 29-D-6
DOCKET NUMBER: LD12-L0042
COMMENTER: INTERNATIONAL MILL SERVICE, INC.
ISSUE: K061
SUBISSUE: Availability of High Temperature Metals Recovery
RESPONSE:

The Agency appreciates the commenter's information on efforts to construct high temperature zinc metal recovery capacity. The Agency is aware that a capacity shortage exists for high temperature zinc metal recovery for high zinc K061 wastes. As part of the Third Third proposed rule, the Agency requested information on efforts to develop additional capacity. Although the Agency is extending the duration of the existing, interim treatment standards (based on stabilization) for another year, the Agency encourages the development of this technology for recovery of metals from K061 wastes.

COMMENT NUMBER: 30-A-1
DOCKET NUMBER: LD12-00117
COMMENTER: Exide Corporation
ISSUE: K069
SUBISSUE: Treatment Standard
RESPONSE:

EPA proposed a lead standard based on K062 wastewater because K062 wastewater had higher metal concentrations than K069 wastewater for most metals. This however, is not true for lead. At the time of developing the proposed standard though, the Agency only had K062 wastewater data available for lead treatment.

During the comment period, EPA received D008 wastewater data (Tischler/Kocurek - LD12-00027) showing higher lead concentration in untreated D008 wastewater than in untreated K062 wastewater. Treatment data for these D008 wastewater (15 sets) showed treatment was possible to between 0.17 to 0.42 mg/l for these 15 data sets. Since the D008 wastewater data have higher lead concentrations in untreated waste than both untreated K069 and K062 wastewater, EPA is using these standards for lead (see Final Background Document for K069, May 1990). The new lead standard for K069 wastewater based on the D008 data is 0.51 mg/l. This value also comports well with the 0.28 mg/l one-day number for the secondary lead subcategory (see 40 CFR Part 421 and also Tables 3 and 4 of background documents showing influent wastewater concentration of 76 mg/l of lead and treated effluent to 0.41 mg/l or less for lead).

Since both the K062 treatment train and the D008 treatment train use chemical precipitation as the method of removing lead from wastewaters, EPA will continue to use K062 treatment data as the basis of the K069 wastewater standard for cadmium (i.e., both K062 and D008 treatment trains use the same technology, hence EPA would still expect to treat

COMMENT NUMBER: 30-A-1 (continued)
DOCKET NUMBER: LD12-00117
COMMENTER: Exide Corporation
ISSUE: K069
SUBISSUE: Treatment Standard
RESPONSE:

cadmium to the same level in either train), since K062 wastewater data are the only data available for cadmium treatment. Hence, the cadmium standard for K069 wastewater will remain 1.61 mg/l.

Comment Number: 30-A-2

Docket Number: LD12-00117

Commenter: Exide Corporation

Issue: K069

Subissue: Treatment Standard

Comment:

For K069 nonwastewater in the calcium sulfate subcategory, EPA has proposed to establish the BDAT treatment standard based upon the transfer of data from the stabilization of K061 waste. Due to Exide's concerns for the transfer of data from wastes generated by other industries, Exide Corporation is instead providing copies (see Appendix 1) of recent analytical data from the testing of calcium sulfate sludge generated at Exide's Reading, Pennsylvania facility.

An examination of the Appendix 1 data indicates EP toxicity values which are typically lower than the characteristic level for metals contained in the waste. A copy of Exide/General Battery Corporation's Determination of Nonapplicability Order with the Pennsylvania Department of Environmental Resources, which delisted the waste from regulatory control as a hazardous waste in Pennsylvania, is attached in Appendix 2.

Given Exide's previously stated concerns about EPA's authority to require stabilization of wastes to achieve leachable metal concentrations which are lower than characteristic levels and Exide's concerns for the transfer of K061 stabilization data to K069 wastes, Exide proposes that the BDAT for K069 Calcium Sulfate Subcategory sludges be written in the following manner:

1) Regulated constituents - lead concentration of 1.7 mg/l and cadmium concentration of 0.50 mg/l (e.g., using the same criteria as specified in Exide/General Battery Corporation's Notice of Nonapplicability Order with Pennsylvania DER) in leachate from the EP toxicity test, and

2) Stabilization (to meet the above criteria) for concentrations in the waste which exceed the concentrations specified above. (For the reasons previously outlined, Exide Corporation requests that a national capacity variance be issued until such time as stabilization capacity can be ensured).

Exide Corporation, for the reasons previously described, is also concerned that the above criteria are not appropriate for K069 (Sodium Sulfate Subcategory) wastes that are expected to be generated at Exide/General Battery Corporation's facility in Muncie, Indiana. Exide Corporation believes that the BDAT treatment standards for this waste would be best written as follows:

1) Metals reclamation by secondary lead smelting, or

2) Stabilization to achieve EP toxicity values at the characteristic level. (For the reasons previously outlined, Exide Corporation requests that a national capacity variance be issued for this waste until such time as stabilization capacity can be ensured).

COMMENT NUMBER: 30-A-2
DOCKET NUMBER: LD12-00117
COMMENTER: Exide Corporation
ISSUE: K069
SUBISSUE: Treatment Standard
RESPONSE:

The commenter has provided the Agency with K069 wastewater influent (untreated) data. No treated (stabilized) data was provided to the agency to prove standards were unattainable.

The Agency believes that the transfer of data from K061 nonwastewater to K069 nonwastewater is technically feasible since K061 nonwastewater contains a much higher concentration of BDAT list metals than K069 nonwastewater. Also, BDAT list metals are similar in both K062 and K069 wastes. In data available to EPA, K061 nonwastewater has total lead concentration of 20,300 ppm, and a cadmium concentration of 481 ppm, whereas, in K069 nonwastewater total lead concentration is only as high as 3,327 ppm and cadmium concentration as high as 130 ppm. Because of the higher metal concentrations in K061, the Agency believes that K061 is more difficult to treat than K062. Therefore, performance achievable for K061 nonwastewater should be achievable for K069 nonwastewater.

Neither delisting "levels" (there are in fact no hard and fast such levels) nor characteristic levels serve as an absolute bar to section 3004(m) standards. HWTC v. EPA, 886 F.2d at 362 (D.C. Cir. 1989).

The Agency has identified two subcategories for K069 waste; i.e., calcium sulfate subcategory and non-calcium sulfate subcategory. In the calcium sulfate subcategory both nonwastewater and wastewater are generated. The calcium sulfate subcategory of K069 nonwastewater was

COMMENT NUMBER: 30-A-2 (Continued)
DOCKET NUMBER: LD12-00117
COMMENTER: Exide Corporation
ISSUE: K069
SUBISSUE: Treatment Standard
RESPONSE:

defined by EPA in 53 FR 31165 to cover a single plant which, to EPA's knowledge is the only plant generating a K069 nonwastewater stream. This one plant is the only plant using the calcium sulfate process. All other K069 generation would be from the noncalcium sulfate subcategory which EPA believes can recover lead, and hence has set lead recovery for noncalcium sulfate nonwastewaters as a method of treatment. Sodium sulfate K069 wastes would be defined as within the noncalcium sulfate subcategory. Hence, the BDAT treatment standards for sodium sulfate is also recycling as a method of treatment (54 FR 48458). If the waste is ever generated, EPA could revise the treatment standard if necessary (see Kennecott v. EPA, 780 F 2d at 452 (4th Cir 1985)). (Discussion of lead in NSPS).

The Agency requested data on March 8, 1990, for stabilized (treated) K069 calcium sulfate waste from the commenter. No data were received by the Agency as of March 12, 1990. If treatability cannot be achieved by the commenter from a well designed and operated system, then the commenter must provide data to prove nonachievability of the standard in an application for variance.

Comment Number: 30 - A - 3
Docket Number: LD12 - 00161
Commenter: SLSA
Issue: 30
Subissue: Treatment Standard
Comment:

6. K069 Calcium Sulfate Subcategory

For nonwastewater forms of K069 calcium sulfate subcategory, EPA has proposed a BDAT based on stabilization of 0.24 mg/l of lead. The SLSA contends that the transfer of technology from K061 is neither technically feasible nor appropriate for this waste. It is the SLSA's understanding that only one lead recycling facility, located in Pennsylvania, generates this waste. The Pennsylvania Department of Environmental Resources has specifically recognized that the proposed BDAT is inappropriate and not technologically feasible. The state has, however, imposed a treatment standard of 1.7 mg/l for this material. The SLSA contends that the 1.7 mg/l treatment standard is more representative BDAT for this waste. Accordingly, the SLSA requests EPA to adopt the state's treatment standard rather than rely on transfer of technology from other waste codes from other industries. In the alternative, the SLSA proposes that EPA grant a nationwide capacity variance for this waste until sufficient technologically feasible treatment capacity becomes available.

COMMENT NUMBER:	30-A-3
DOCKET NUMBER:	LD12-00161
COMMENTER:	Exide Corporation
ISSUE:	K069
SUBISSUE:	Treatment Standard
RESPONSE:	

The commenter has provided the Agency with K069 wastewater influent (untreated) data. No treated (stabilized) data was provided to the Agency to prove standards were unattainable.

The Agency believes that the transfer of data from K061 nonwastewater to K069 nonwastewater is technically feasible since, K061 nonwastewater contains a much higher concentration of BDAT list metals than K069 nonwastewater. Also BDAT list metals are similar in both K062 and K069 waste. In data available to EPA, K061 nonwastewater has total lead concentration of 20,300 ppm and cadmium concentration of 481 ppm, whereas, in K069 nonwastewater, total lead concentration is only as high as 3,327 ppm and cadmium concentration as high as 130 ppm. Therefore, the Agency believes the same level of performance achievable for K061 nonwastewater is expected to be achievable for K069 nonwastewater.

If treatability cannot be achieved by the commenter from a well designed and operated system, then the commenter must provide data to prove nonachievability of the standard in an application for variance.

Comment Number: 30 - B
Docket Number: LD12-00117
Commenter: Exide Corporation
Issue: 30
Subissue: General Issue
Comment:

The appropriate name for the waste should be changed to K069 Calcium Sulfate/Sodium Sulfate Subcategory.

COMMENT NUMBER: 30-B
DOCKET NUMBER: LD12-00117
COMMENTER: Exide Corporation
ISSUE: K069
SUBISSUE: General Issues
RESPONSE:

The Agency acknowledges the commenter's request to change K069 calcium sulfate subcategory to calcium sulfate/sodium sulfate subcategory.

In 54FR 48458 the term "K069 Calcium Sulfate" was intended to be "Non-Calcium Sulfate." The Agency has identified two subcategories for K069 waste; i.e., calcium sulfate subcategory and non-calcium sulfate subcategory. In the calcium sulfate subcategory, both nonwastewater and wastewater are generated. The calcium sulfate subcategory of K069 nonwastewater was defined by EPA in 53 FR 31165 to cover a single plant which, to EPA's knowledge, is the only plant generating a non-recyclable K069 nonwastewater stream. This one plant is the only plant using the calcium sulfate process. All other K069 generation would be from the noncalcium sulfate nonwastewaters as a method of treatment. Sodium sulfate subcategory would be defined as with the noncalcium subcategory. Hence, the BDAT treatment standards for the sodium sulfate subcategory is recycling as a method of treatment (54 FR 48458).